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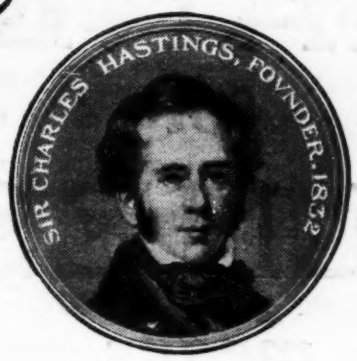

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An Address

ON

SOME CHANGES IN OBSTETRIC PRACTICE SINCE THE FOUNDATION OF THE MEDICAL SOCIETY OF LONDON.

DELIVERED BEFORE THE SOCIETY ON OCTOBER 8TH,

BY

HERBERT R. SPENCER, M.D., B.S., F.R.C.P.,
OBSTETRIC PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL;
PRESIDENT OF THE SOCIETY.

THE Medical Society of London was founded in 1773 at an important period in the history of British midwifery. The renaissance of midwifery occurred later in England than in Continental countries, and dated from the publication in 1651 of William Harvey's *De generatione animalium* with the chapter on "Labour," which was the first original English work on midwifery. The conservative principles and the observation of Nature which Harvey advocated had been carried on by a succession of teachers, of whom Smellie — one of the greatest obstetricians of all times and countries — had died only ten years before the Medical Society was founded; he was succeeded by William Hunter, Denman, Osborn, and others.

The practice of midwifery during the preceding century had been slowly passing into the hands of men midwives since Clément had been ennobled by Louis XIV and appointed "accoucheur" to Madame la Vallière in 1673. The advice of Harvey to imitate Nature, "who is a perfect operatrix," had been in the main followed by British obstetricians, who have always considered the interests of the mother superior to those of the child. This attitude, which is indubitably the best for cases where the pelvis and child are of normal dimensions, led to the death of many children and mothers when it came to be applied in cases of contracted pelvis. For cases of slight contraction the powers of Nature were often sufficient, aided by the "hanging-legs" position of the mother (Scipione Mercurio, 1595). Version (an ancient operation which had been revived by Ambroise Paré, and recommended by Harvey "when there is necessity for handiwork in the business") and forceps (invented by Chamberlen and greatly improved by Levret, Smellie, and Benjamin Pugh) proved unsatisfactory when serious contraction of the pelvis had to be dealt with. Experience has shown that these measures involve considerable risk to the mother and child; and the dreadful alternative, embryotomy, necessitates the sacrifice of the child.

FIG. 1.—Jean René Sigault, who performed the first symphyseotomy (October 1st, 1777). (From a print in the library of the Royal College of Physicians.)

It was just at this time that important advances were made in the study of the contracted pelvis. Smellie in 1754 had been the first to give a representation of the rickety pelvis. At the same time he measured the diagonal conjugate of the pelvis, and R. W. Johnson in 1769 published his method of direct measurement of the true conjugate diameter with the hand. In 1772 Stein published a description of his internal pelvimeter, and in 1775 Baudelocque described his instrument, which is still used for the measurement of the external diameters of the pelvis. Smellie's plates (published in 1754) and W. Hunter's *Gravid Uterus* (1774) raised the artistic representation of pregnancy and labour to the highest point of excellence.

Sir Fielding Ould, who was master of the Rotunda Hospital from 1760 to 1766, made the first observations on the entrance of the head into the pelvis and laid the foundations of the "mechanism of labour." He pointed out the danger of the high forceps operation in cases of contracted pelvis, invented an instrument (the "terebra occulta") for perforating the child's head, and stigmatized Caesarean section as "a detestable, barbarous, illegal piece of inhumanity." At this time, too, there was a great movement in the world towards the development of the special study of obstetrics. Lying-in hospitals and chairs of obstetric medicine were being founded, particularly in Italy. At Padua, where Harvey had studied, a chair of obstetrics was instituted in 1769. In Vienna extensive lying-in wards were being built in the Allgemeine Krankenhaus and were opened in 1784.

In 1786 Lucas Johann Boër (1751-1835) went to study in Paris under Baudelocque, Lauverjat, and others. After spending fifteen months in Paris he came in 1787 to England, where he studied under Denman, Osborn, Clarke, and Lowder. His travels in Great Britain, where midwifery was conducted on conservative, or at least expectant, lines—following the teaching of Harvey, Smellie, and W. Hunter—made a great impression on Boër: "he had learnt in France what art, in England what Nature, could do." He carried out his conservative principles while professor of the lying-in wards of the great General Infirmary in Vienna, which he raised to the first position in Europe. Boër held the chair of obstetrics in Vienna for thirty-three years. In 2,926 labours he only employed the forceps 19 times and perforated the head 8 times. He laid down very strict rules for the artificial interference with labour, insisting that this should only be resorted to in cases of necessity, and then in the gentlest and most suitable manner; "all artificial means apart from strict necessity are mere bungling, involving the risk of torturing and destroying mother and child." While Boër was in Paris he saw the patient Souchot, on whom Sigault had performed symphyseotomy: she was suffering many discomforts as a result of the operation—the uterus was prolapsed, the pubic joint was ununited, and there was incontinence of urine from a fistula.

On the Continent other attempts were made to solve the difficulty of the contracted pelvis by symphyseotomy and by Caesarean section, but the results of these operations were not such as to commend them to the British obstetricians.

LUCAS'S RESTRICTED DIET.

Measures directed towards the mother having proved unsatisfactory, an ingenious attempt to overcome the difficulty of labour in contracted pelves by procuring a small child by restricting the diet of the mother was made by James Lucas, surgeon at the Leeds General Infirmary. His paper was read before the Medical Society of London on

September 8th, 1788, was communicated by our founder, J. C. Lettsom, and is printed in the second volume of the *Memoirs* of the Medical Society of London (1794). The treatment consisted in "temperance in diet, a diminution in the usual quantity and a change in the quality of the food, an increase in exercise, the occasional loss of a few ounces of blood, and the moderate use of cooling aperients. This regimen was more strictly enjoined in the last months of pregnancy from a persuasion that an observance of it in the former months would avail little if neglected in the latter."

Lucas mentions a case of contracted pelvis where embryotomy had been performed in the two previous labours; under his treatment the next labour was remarkably less tedious and the child was delivered without difficulty. He gives other instances of the benefit of this treatment. This method of starving the mother to diminish the size of the child is usually attributed to Prochownick, who published a paper on the subject in 1901. It is interesting to find that it was first published by the Medical Society of London more than a century before. The method, of course, has its limitations and is very rarely employed at the present day; but I have recently seen a patient who was successfully delivered in America of a small child after adopting the treatment recommended by Lucas.

Symphyseotomy and Pubiotomy.

In the year 1772 Jean René Sigault published a paper, "An in partu contra naturam sectio symphysis ossium pubis sectione caesarea promptior et tutior?" Five years later, on October 1st, 1777, he first performed the operation on a patient named Souchot, delivering her of a living child, the mother recovering with the discomforts and inconveniences already mentioned. The Faculty of Medicine of Paris had a medal struck in Sigault's honour and in many directions there was great enthusiasm over the operation. But next year, in 1778, Piet reported that he had previously delivered the patient Souchot of a large child with prolapse of the cord without much difficulty, and thus took away a little of the credit of Sigault's achievement. Gradually the enthusiasm died down on the Continent and in England the operation was looked on with disfavour, mainly owing to the researches and writings of the Hunters and Denman. The first time this operation was performed in England was in 1782 by Welchman.[1] The child was dead and the mother succumbed.

It was only in Italy that the operation continued to be performed, though sporadically, till it was revived by Morisani in 1881 and by Pinard in 1900; the latter in 100 operations had a mortality of 12 per cent. for the mothers and 13 per cent. for the children. Since that date the division of the symphysis and its modification pubiotomy have been extensively practised on the Continent and to a less extent in this country, with a gradually diminishing rate of mortality. The reason why it has not been more in favour is that it inflicts considerable injuries on the mother and has a higher rate of mortality for the child than Caesarean section. It has the advantage that in a doubtful case it permits a trial of the effects of labour without increasing the risk of the operation and may be employed in a limited class of cases of slight pelvic contraction. In this country, however, the enthusiasm of some of its advocates appears to have evaporated. I have never performed the operation, and am of opinion that it is very rarely indicated if the cases of contracted pelvis are properly investigated during pregnancy. The disadvantages of symphyseotomy and pubiotomy have led to other operations for enlarging the pelvic cavity, such as excision of the pubic bones and of the sacral promontory; but these operations have not led to any practical results.

The Induction of Premature Labour.

Of this life-saving operation, purely English in origin, we have the first account in Denman's *Introduction to the Practice of Midwifery* (third edition, 1801, p. 394). It was given to Denman by Dr. C. Kelly, who informed him that

[1] "about the year 1756 there was a consultation of the most eminent men in London at that time, to consider the moral rectitude of, and advantages which might be expected from the practice, which met with their general approbation. The first case in which it was deemed necessary and proper fell under the care of Dr. Macaulay and it terminated successfully. The patient was the wife of a linen draper in the Strand. Dr. Kelly had himself performed the operation three times on the same woman and twice the children had been born living."

Denman defines the limitation of the operation in these words: "It is in those cases only in which there is a reduction of the pelvis to a certain degree and not beyond that degree that this operation ought to be proposed or can succeed." He mentions the case of a lady of title who had had four dead children at term. Labour was induced early in the eighth month of her pregnancy and the child was born alive and survived.

Denman induced premature labour by puncturing the membranes, and stated his opinion that the operation is perfectly safe to the person on whom it may be performed. Puncture of the membranes is still used by some obstetricians (for example, v. Herff) as a means of inducing labour; but the favourite method is the bougie method, first employed by Sir J. Simpson in 1854. It is usually described as Krause's method, whose publication, like Simpson's, is dated 1855.

The induction of premature labour has always remained an essentially British and mainly English operation. In France it was opposed by the great authorities Baudelocque and Capuron, and not till 1830 was it favoured by Stolz. In Paris it was first performed by P. Dubois in 1840, but was condemned on insufficient grounds by Pinard in 1900. In Germany Wiedmann wrote in its favour in 1779; his pupil Wenzel was the first to perform it in 1804, and his paper with Froriep's commendation led to its adoption in Germany, where it is still practised, but is by no means a favourite operation. In Berlin it was first employed by v. Siebold in 1819. In the Scandinavian countries it was not performed till the year 1827. In America Whitridge Williams, of Johns Hopkins Hospital, Baltimore, states that he has never found it necessary to resort to the induction of premature labour in contracted pelvis. His erroneous reasoning in adopting this attitude has been pointed out by Dr. Herbert Williamson in an excellent article.[2] I will only add here that in his alternative treatment by Caesarean section Dr. Whitridge Williams finds it necessary to resort to the mutilation of the mother by hysterectomy with remarkable frequency.

From this brief historical review of the induction of premature labour it will be seen that the operation has met with little favour on the Continent of Europe and in America. If one inquires into the cause it is found in three factors—that the operation has been performed in unsuitable cases, at unsuitable times, and by unsuitable means.

The cases of contracted pelvis suitable for the induction of premature labour are those with a true conjugate diameter of not less than 3¼ inches; the operation should not be undertaken before the thirty-fifth week from the last day of the last menstruation, and the bougie method of Simpson or rupture of the membranes is the best method for ordinary cases. Champetier de Ribes's bag may be required in special cases, though it has the great disadvantage (amongst others) that it displaces the presenting part. For a pelvis with a conjugate diameter less than 3¼ inches in length Caesarean section is more suitable, though I have delivered by induction at the thirty-fifth week through a pelvis with a 3-inch conjugate a child who grew up to womanhood. The mother died some years later after an operation for cancer and the pelvis is exhibited to-night.

Carried out in the manner indicated induction of premature labour is an excellent operation, giving results to the child less favourable indeed than Caesarean section, but to the mother even better than those of natural labour at term. The operation has been repeated in one of my cases twelve times with the result of twelve living children. The larger the pelvis over the 3¼-inch minimum the later the induction should be deferred, but for pelves with a 3¾-inch true conjugate it is better generally to let the patient go to term unless the head is unusually large. It is important that the delivery of the premature child be left to the natural powers, forceps and version being particularly injurious to these infants.

Having had a large experience of this beneficial operation, having watched the upgrowing of some of these premature

girls to normal womanhood and motherhood, it is more in sorrow than in anger that I see the unpopularity of the operation with many foreign obstetricians and their failure to follow the three simple rules above enumerated, which are essential for success.

Antisepsis and Anaesthesia.

Before I proceed to consider Caesarean section for contracted pelvis it may be well to review the development of the antiseptic treatment which has revolutionized this and other operations.

In 1772 Charles White of Manchester published a *Treatise on the Management of Pregnant and Lying-in Women*. In this work White speaks of puerperal fever as a putrid fever which is contagious and arises from putrefaction of retained products or from the air of lying-in wards. White's contribution to the study and treatment of puerperal fever was an important one and has been dealt with very fully by Professor Adami in his Lloyd Roberts Lecture.

In 1843 Oliver Wendell Holmes published in the *Quarterly Journal of Medicine and Surgery* a paper on "The contagiousness of puerperal fever," in which he adduces strong evidence of the contagiousness of the disease and points out effective means of preventing it. He specially mentions changing the clothes and washing the hands with chloride of lime after visiting cases of puerperal fever; he reports that by adopting these precautions a doctor was able to attend other cases of labour which ran a perfectly normal course.

FIG. 2.—Headpiece of Sacombe's *Élémens des accouchemens* (1802) depicting Hercules destroying the Caesarean hydra.

In 1846 Ignaz P. Semmelweis became assistant in the lying-in wards of the General Hospital in Vienna. From 1784 to 1822 these wards had been under the care of Zeller (1784-89) and Boër (1789-1822) and the mortality from puerperal fever had been 1.25 per cent. over the whole period. Under Boër's successor Klein medical students were allowed to practise anatomy and to dress suppurating wounds while attending cases of labour, and Semmelweis noticed that the mortality was much higher in the wards attended by the medical students than in those attended by the midwives. In the five years before Semmelweis's appointment the mortality in the students' wards had risen from 6.56 to 9.92 per cent., while that in the midwives' wards had fallen from 5.58 to 3.38 per cent. Semmelweis adopted the method of washing the hands with chloride of lime, with the result that the rate of mortality fell from 8.3 to 2.3 per cent.

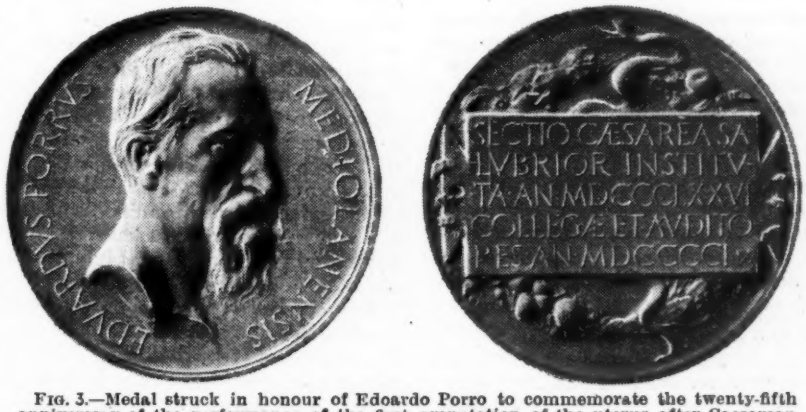

FIG. 3.—Medal struck in honour of Edoardo Porro to commemorate the twenty-fifth anniversary of the performance of the first amputation of the uterus after Caesarean section (1876).

It is the undying merit of Semmelweis to have pointed out that puerperal fever arose not only from infection from corpses, but from any putrefying organic substances. What putrefaction was due to was shown by the researches of Pasteur in 1860, and Lister in 1867 gave to the world his antiseptic treatment, which laid the foundations of the modern aseptic surgery, by which the danger has been almost completely removed from operations which a few years ago were uniformly fatal.

The introduction of *anaesthesia* by means of ether (Morton, 1846) and chloroform (Sir James Simpson, 1847) was one of the greatest advances ever made in medicine. For prolonged operations I think there can be no doubt that ether is preferable; but in ordinary midwifery cases chloroform, administered *à la reine*, is still the best and safest means of alleviating the pains of labour, and it is excellent, administered until the child is delivered, in cases of the classical Caesarean section. The attempt to produce painless labour by the injection of scopolamine and morphine has not proved successful and is not free from danger to mother and child.

Caesarean Section.

Caesarean section has always been interesting, and never more so than at the present day. The origin of the word "Caesarean" is unknown. On the supposed birth of Julius Caesar by means of this operation, based on an error in the translation of a passage in Pliny, Sacombe has given his opinion in the following terms: "Pliny was a lying historian whom it would have cost no more to split the belly of Aurelia with his pen in order to deliver Caesar than to split the rocks with vinegar to open up a way across the Alps for the troops of Hannibal."

The first volume of the *Memoirs* of the Medical Society of London contains a most learned paper in the form of a letter addressed to Lettsom on the character of Aesculapius. The writer of the letter describes the birth of Aesculapius by Caesarean section as mentioned in Ovid's *Metamorphoses*,

> natum flammis uteroque parentis
> Eripuit geminique tulit Chironis in antrum.

Despite these illustrious examples, Caesarean section attained but little popularity until the end of the eighteenth century, although it had been practised on the Continent, with only occasional success.

In England it was twenty years after the foundation of our Society—in 1793—that the first successful operation was performed on a living woman by Barlow of Bolton; the child did not survive.

Ambroise Paré (1510-1590), having seen two Caesarean sections performed by his pupil Guillemeau, with fatal results to the mothers, was opposed to the operation: "Je ne conseillerai jamais de faire tel œuvre où il y a si grand péril sans nul espoir."

In 1581 Rousset had published the first work on the subject under the title *Hysterotomotokie*.

In 1595 Scipione Mercurio had recommended the operation. He had seen patients on whom it had been performed in Toulouse, where he said it was as well known as bleeding for headache. He gave an illustration of the operation and recommended that the incision should be made to the right of the middle line in order to avoid the spleen.

At the time our Society was founded there was a widespread desire amongst obstetricians to avoid the horrible craniotomy which at the end of the eighteenth century was performed frequently, especially in England. The most eminent of these obstetricians was Jean Louis Baudelocque. On the "17 ventôse de l'an iv" (1796) Baudelocque performed Caesarean section on a patient who had previously had a living child at term; the patient died three days after

the operation. As a result of this unfortunate experience Baudelocque was assailed with the most violent obloquy by Jean François Sacombe, an eloquent, witty, and scurrilous charlatan, who occupies such a remarkable position in the history of Caesarean section that a few particulars of his career may be worth mentioning.

J. F. Sacombe.

Sacombe was born about the year 1750 at Carcassonne. After studying obstetrics at Montpellier and in England under Osborn and W. Hunter he went to Paris to practise as an accoucheur. He gave out that he could deliver any patient with his hand alone, without the use of any instrument. He was especially bitter against those who performed Caesarean section, and from the year 1790 onwards he disseminated his views by lectures, pamphlets, and posters. In one of the pamphlets he pilloried Baudelocque as a "murderer," for which libel he was condemned to pay a fine of 3,000 francs. Unable to pay the fine, he fled from Paris, but returned under the altered name of Lacombe in 1813. Having lost his obstetric practice he gained a living by selling secret remedies. "Deserted by Lucina, he paid attention to Venus," wrote a work entitled *Venusalgia*, and died discredited and neglected in 1822.

In order to carry on his campaign against Caesarean section, Sacombe founded his "École anti-Caesarienne" in 1798. Here lectures were given and an annual festival was held at which a silver medal was awarded to one of the pupils; on one side of the medal was the figure of Hercules slaying the hydra, with the inscription "No more Caesarean section"; on the other side a beehive and flying bees, and the inscription "Sacombe's anti-Caesarean School." The recipient of the medal had the privilege of embracing Madame Sacombe.

A statue of Bonaparte was set up in the school and Sacombe dedicated one of his works to him, and at one time praised the Consul for "muzzling the Caesarean tigers." In 1815, however, he was imprisoned for writing against the Emperor. Sacombe was a prolific writer, both in prose and verse. In his *Lucine Française* (1803) he gives an account of François Rousset, whose work on Caesarean section had been highly praised by Haller and Portal. Several faculties of medicine had disputed the glory of conferring a degree on Rousset, and Catherine de Médicis had appointed him her physician.

"However, I resolved," says Sacombe, "to overturn this colossal statue, to break it and to prove to my pupils that celebrity in medicine can only be desirable when based on talents and virtue. I will demonstrate that Rousset was neither a physician nor a surgeon, but a fanatic and ignorant criminal, and the vile instrument of depopulation of which the infamous Catherine de Médicis made use against the Protestants."

In his *Élémens de la science des accouchemens* (1802) he styles himself "Professeur de médecine et de chirurgie des accouchemens," yet he speaks contemptuously of accoucheurs as "hermaphrodites of the art" and "midwives in breeches." Of Clément, the first "accoucheur," he writes:

> Clément dut au hazard sa vogue et son crédit
> Il enrichit moins l'art que l'art ne l'enrichit.
> Accoucheur des Laïs, en dépit de Lucine
> Clément fit fortune où maint amant se ruine.

Sacombe's *Élémens* contains a portrait of the author and a plate of the École anti-Caesarienne, with a figure of the Caesarean hydra struck down "30 brumaire, an vii" (Fig. 2). Of this monster he writes:

"Born in the midst of the civil wars which desolated France towards the middle of the sixteenth century the Caesarean hydra, attracted by the odour of human blood, has raised again its hideous head amidst the scaffolds which crowned the soil of France at the end of the eighteenth century."

He ends his work:

"My task is complete; I have avenged Nature and consoled humanity in giving the death blow to the Caesarean hydra."

It was, however, not by the École anti-Caesarienne nor its discredited founder that the performance of Caesarean section was rendered infrequent, but by the almost uniformly fatal results of the operation at the end of the eighteenth century.

In 1866 Murphy found that of 56 operations in Great Britain 46 had terminated fatally (82 per cent.). Even as late as 1874 the maternal mortality was 54 per cent. in Europe and America.

Porro and Sänger.

In 1876 Porro (Fig. 3) introduced his method of amputating the uterus after the section. The effect of this, combined with Lister's antiseptic method, was to lower the death rate considerably, so that in Truzzi's great collection of all the "Porro" operations published up to 1901 the death rate was reduced to 24.8 per cent.

In 1882 Sänger introduced his method of suture, which still remains the favourite, and though various modifications have since been recommended, such as the incision into the lower segment and the subperitoneal and transperitoneal incisions, the Sänger conservative method with silk sutures carefully buried by a continuous peritoneal stitch has advantages over other methods in uninfected cases. The advantages of the Sänger incision and suture are (1) the rapid delivery of the child in an unasphyxiated condition; (2) the operation can be repeated with safety; (3) adhesions and rupture are rare if the wound be properly sutured with silk.

Results of Modern Caesarean Section.

The results of the modern Caesarean section in non-infected cases are highly satisfactory. Thus Routh in 1910 found a maternal mortality of 2.9 per cent. in "clean" cases, of 10.8 per cent. in cases with ruptured membranes, and of 34.3 per cent. in cases where frequent examinations or attempts at delivery had been made. From those and from figures collected by Holland (who dealt with hospital cases only) it is seen that to obtain a low mortality rate it is necessary that the mothers should not be infected when operated on. In such cases the operation should be free from mortality, and in my personal practice has been so.

Abuse of Caesarean Section.

The safety of the operation in skilled hands has led to a great abuse of the operation by its performance in cases in which it is quite unnecessary and often quite unsuitable. I have known it proposed for a patient with a large pelvis solely because she was 38 years of age; she was easily delivered by Nature of a 9 lb. child. When we read of hospital staffs and even individuals performing a hundred Caesarean sections in a year, it is time to make a protest against unnecessary operative interference. The most marked instance of "meddlesome midwifery" is contained in a work by I. W. Potter entitled *The Place of Version in Obstetrics* (1922). This author delivered 1,130 women in the year ending August 31st, 1921; of these, 100 were delivered by Caesarean section and 938 were delivered by version. It is to be regretted that such a line of practice should be advocated, as it will inevitably be attended with disaster in the hands of less skilful imitators.

Francis Bacon commends as excellent for the advancement of learning the keeping of Registers of Doubts, with the caution that "when the doubts be thoroughly sifted and brought to resolution, they be from henceforth omitted, discarded, and not continued to cherish and encourage men in doubting."

In obstetrics there have been many doubts. But doubt that natural labour is in ordinary cases preferable to operative labour should have been discarded long ago.

In the *Boston Medical and Surgical Journal* of June 14th, 1923, there is a thoughtful and remarkable article on Caesarean section, in which the author says:

"In the minds of certain obstetricians or surgeons Caesarean section is the only method by which a self-respecting patient can be delivered and maintain her standing in the community."

He also states—

"that the mortality statistics of Massachusetts show that of the women dying during pregnancy and labour in a given period approximately one-third die of complications which have been treated by Caesarean section."

Finally, the writer of the article appeals for protection for women in childbirth against the ill judged enthusiasm of the untrained obstetrician.

It is evident that Caesarean section, which Sacombe thought he had put an end to in 1798, has shown marked evidence of revival, and his hydra has developed "heads" which were non-existent in his day. The performance of Caesarean section for cases of placenta praevia, accidental haemorrhage, malpresentations, and eclampsia is being overdone, though not to the same extent as for "contracted pelvis."

It is sad that such a beneficial operation as Caesarean section, which has been developed to such a pitch of perfection that a woman, however deformed, can be delivered with safety to herself and child, should be brought into discredit by being performed in cases for which it is unnecessary.

Antenatal Diagnosis.

I have endeavoured to show some of the changes which have occurred in the treatment of contracted pelvis in the lifetime of the Medical Society of London. Further improvement of the treatment depends on more accurate measurement of the pelvis and foetal head, probably by means of *x* rays. Every woman should have her pelvis measured to see if she is fitted for child-bearing. During pregnancy she should be examined at the thirty-fourth week to ascertain the presentation of the child and its size relative to that of the pelvis. If the pelvis is contracted, it should be treated by one of the methods suitable for the particular case. Of these methods at the present time, in my opinion, induction of premature labour is employed too little and Caesarean section too much. As opinions are of less value than facts I give the results of three years' practice at University College Hospital, where the routine mentioned above has been adopted.

In the three years (1920, 1921, and 1922) 5,647 women were delivered. Of these, premature labour was induced for contracted pelvis 113 times, all the mothers and 101 of the children surviving. Caesarean section for contracted pelvis was performed 32 times, all the mothers and 30 children surviving. Craniotomy was performed 4 times (twice for dead children and twice for hydrocephalus); the four mothers recovered. Forceps were used (for various reasons) 168 times (that is, in less than 3 per cent. of the cases), all the mothers recovering. I am indebted to the obstetric registrar, Mr. Leslie Williams, for these figures.

Remaining Risks of Caesarean Section.

Caesarean section entails risk of hernia, of adhesions, and rupture in subsequent pregnancy. These risks are probably avoidable in aseptic cases by proper suturing and sutures. How great these risks are can only be ascertained when obstetricians publish all their cases instead of a selection of cases done in favourable conditions before or in the early stages of labour, other cases being treated by craniotomy or hysterectomy. The sterilization of a woman after Caesarean section in an uncomplicated aseptic case is, in my opinion, not justifiable; in complicated cases hysterectomy is sometimes required.

Conclusion.

In conclusion, I hope I may be pardoned for bringing a somewhat technical subject before the Medical Society of London. In the past some hard things have been said of obstetricians; in recent days, however, they have been commended as integrators of medicine. Agreeing with Sir Clifford Allbutt as to the importance of that integration, I have placed my views before a Society which by its constitution and practice is the best example of the advantage to be derived from discussion of medical subjects by physicians, surgeons, and general practitioners. With the assistance of the medical and surgical secretaries, of whose devotion to the interests of the Society I have already evidence, I hope to be kept mindful of that integration at the meetings over which it will be my privilege to preside.

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THE REGULATING AND REFLEX PROCESS.*

BY

P. T. HERRING, M.D.,

PROFESSOR OF PHYSIOLOGY, ST. ANDREWS UNIVERSITY, AND PHYSIOLOGIST TO THE ST. ANDREWS INSTITUTE FOR CLINICAL RESEARCH.

Part II.—THE NERVE IMPULSE: THE IMPORTANCE OF THE RECEPTORS: AND THE PRODUCTION OF PAIN.

The anatomical unit of the nervous system, the neurone, consists of a nucleated cell body and one or more processes, one of which is always an axis cylinder. The other processes, when present, are dendrons, and frequently break up into numerous small branches known as dendrites. The function of the whole unit—dendrons, cell body, and axis cylinder—is to conduct the nerve impulse. The conducting element is a watery fluid containing protein and lipoids in the colloidal state, and possessing the physico-chemical attributes of living matter in this condition. No fibrils can be seen in the living neurone, though they appear in the dead nerve after certain methods of fixation and staining have been employed. The cell body and dendrons frequently contain a store of reserve energy in the form of nucleo-protein, which, when coagulated by certain fixatives and suitably stained, gives rise to the so-called Nissl bodies. The nucleus presides over the nutrition of the whole neurone and maintains it in a condition suitable for carrying the nerve impulses. But the presence of the nucleus and cell body is not essential for the passage of the nerve impulse, for, if cut off, the remainder of the neurone can still conduct for a limited time before it dies.

The nerve impulse, when excited by artificial means in an isolated nerve fibre, travels in both directions from the point of stimulation, but in the intact nervous system the nerve impulse travels normally in one direction only. The synapses between the neurones are irreciprocal, possessing a valve-like action which prevents any accidental impulse that may have been carried in the wrong direction from passing into the next neurone. The synapse only allows a nerve impulse to pass from the endings of the axis cylinder of one neurone to a dendron or cell body of the next neurone. Consequently the nerve impulse can only take the one direction through a physiological unit, and the neurone, when in a state of activity, only transmits its impulses in a forward direction.

The cell bodies of the peripheral afferent neurones are found in the ganglia on the posterior roots of the spinal cord, and in the corresponding ganglia on the cranial sensory nerves. The peripheral nerve fibre of each cell, though it possesses an axis cylinder, is morphologically the dendron of what was originally a bipolar cell. This dendron runs directly into an axon at the T-shaped junction near the body of the nerve cell in the ganglion, and there is evidence that the nerve impulse passes directly over this junction. Some of the spinal ganglion cells have small intracapsular dendrons, and consequently nerve impulses can reach the neurone through them, in which case the cell body must also be concerned in conduction. But little is known about the function of the intracapsular dendrons of the spinal ganglia. Their presence, however, indicates that a certain amount of analysis and redistribution of nerve impulses may take place in these ganglia.

In the olfactory nerve the cell body of the first afferent neurone lies in the olfactory membrane itself, and its dendron is a specialized portion of the cell which forms a tiny projection on the surface of the membrane. In the auditory and vestibular nerves the cell bodies are bipolar, and the peripheral process of each cell, though really a dendron, forms arborizations among the cells of the sense organs which are developed as special receptors. Little is known about the afferent neurones of the viscera, but there

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is reason to believe that they are similar to those of the other afferent neurones except that their cell bodies may be smaller and their processes finely medullated.

The afferent neurone conducts nerve impulses into the central nervous system. Its axis cylinder, after reaching the brain or spinal cord, as a rule divides into ascending and descending branches, which in their turn give off other branches ending in synapses with the dendrites of other neurones. The path taken by the nerve impulse in the central nervous system is partly determined by the anatomical distribution of the axis cylinder carrying it, and partly by the character and resistance of the synapses it meets.

THE NERVE IMPULSE.

The nature of the nerve impulse is unknown. It is not an electrical current, but is immediately preceded by a temporary change in the electrical potential of that portion of the axis cylinder which is at the moment conducting the nerve impulse. Such change in the electrical potential is common to living tissues in a state of activity, and by suitable means can be demonstrated as a "current of action." The whole neurone does not go into activity simultaneously, but responds to a stimulus in a characteristic manner. The response takes the form of a nerve impulse which travels from the point of excitation at a definite rate of about 120 metres per second. The nerve impulses, though capable of following one another at a frequency of from 50 to 60 per second, cannot fuse because after the passage of each impulse the nerve fibre is for a minute fraction of a second in a refractory state, during which it is incapable of conduction.

The nerve fibre requires a supply of oxygen to enable it to maintain its power of conduction, but it shows no measurable sign of oxidation, no rise of temperature, and no fatigue, even after long-continued activity. Further, the individual nerve impulse, as shown by the work of Keith Lucas and Adrian, is practically invariable in strength. It obeys the law of "all or nothing." The weakest stimulus that is effective produces a maximal response in the neurone. In other words, there is no grading of the individual nerve impulse. The number of impulses carried in unit time may vary, but cannot exceed a maximum imposed upon the neurone by the length of the refractory period. The only exception to the constancy of strength of the nerve impulse lies in the fact that immediately after the refractory period there is a supernormal phase in the neurone during which the response is a little stronger. The nerve impulse is always of the same nature by whatever nerve it is carried. This principle is the basis of Müller's law of "specific energies" or "specific irritability." It means that the end-result of the stimulus of nerve is determined, not by the character of the nerve fibre, but by the nature of its ending.

If we assume that the neurone has no power of automaticity, and that it only conducts in a forward direction, we are driven to seek the origin of all nerve impulses in the receptors on the afferent side of the nervous system. Whether the first assumption is true or not for all parts of the nervous system, it is so as regards the production of normal sensation and of reflex action, and it provides a good working hypothesis for clinical purposes. The nature and site of the receptors become matters of special importance.

THE RECEPTORS.

The receptors are widely different in structure and possibly in the manner in which they convert the adequate stimulus into a nerve impulse. In some instances the receptor appears to be a part of the dendron of the first afferent neurone itself. In the olfactory mucous membrane the dendron of the olfactory cell forms a fine projection which is stimulated by chemical substances in solution on the surface of the olfactory membrane. In the retina the outer ends of the rods and cones, modified dendrons, are stimulated by light, and possibly the actual stimulus is again a chemical one, depending upon the decomposition by light of a photo-chemical substance in them or in their neighbourhood.

In other sense organs the receptors are not always a part of the neurone itself, but special organs with which the neurone comes into close association. In the cochlea and vestibular apparatus the receptors are hair cells which are adapted to respond to a mechanical stimulus, and their response is converted into a nerve impulse in the neurones. Now nerve fibres are comparatively inexcitable whereas receptors respond to forms of energy which have no effect upon nerve, and which may be infinitesimally small in amount. The receptor is specially adapted to respond to some particular form of energy, and it acts as a transformer of this energy, and when necessary adds energy of its own in order to produce the excitation of the neurone. The most effective stimulus of nerve is an electrical one of a very definite character. The nature of the optimal stimulus of nerve—the "characteristic" as it was named by Waller—has been more exactly determined by Keith Lucas. It is not so much a matter of difference of electrical potential as of the rate at which the alteration in potential takes place. Changes in electrical potential of this nature occur in living structures when set into activity, and it is possible that this factor is made use of in the excitation of nerve by some receptors. The receptor is set into activity by an appropriate stimulus for which it is adapted by structure, the stimulus being of a physical or chemical nature, and the change of potential thereby induced in the receptor may be the actual cause of excitation of the adjacent nerve fibres.

The receptors of the body are divided into two main categories: the exteroceptors, which receive stimuli from sources of energy outside the body, such as light, sound, and pressure; and the interoceptors, which are affected by events taking place inside the body. The proprioceptors are an important variety of the latter, and are the receptors which are excited by the tension of muscle, ligaments, and tendons, and the action of gravity. The proprioceptors give origin to the reflexes concerned with the maintenance of muscle tone and the posture of the body.

Receptors are not provided for all forms of energy—as, for example, Roentgen rays and ultra-violet light—and unless appropriate receptors are present such forms of energy do not excite nerve impulses nor give rise to sensation or reflex action. They may exert an influence upon the tissues of the body, but not of a nature adequate to excite nerve impulses until damage to the tissues is actually done.

The same form of energy may excite different receptors, especially when it differs in degree. Heat affects the receptors in the skin, and gives rise to the sensation of heat. If the wave-lengths are appropriate they excite the receptors in the retina and the sensation of light results. The same stimulus may excite the production of more than one sensation. Heat applied to the skin may cause a sensation of heat and a sensation of pain; pressure the sensations of pressure and of pain. The two sensations may be ascribable to the action of the same stimulus upon different receptors, and the paths of the nerve impulses are then separate from their origin to their termination in the higher levels of the central nervous system. There are receptors which, when excited by an adequate stimulus, give rise to nerve impulses producing reflexes, but which are not normally associated with consciousness. Many of the interoceptors are of this nature, and initiate reflexes which are unaccompanied by sensation. On the other hand, the receptors which are concerned with the production of sensation may at the same time initiate reflexes. In the "conditioned" reflex the same receptor probably serves for both sensation and reflex. In some instances the same receptor gives rise to a nerve impulse which almost immediately spreads into two or more afferent channels and is carried to different parts of the brain. Light falling upon the retina excites its receptors, and the nerve impulses set up pass by different paths to produce the sensation of light and the reflex movements of the pupil. The retina is exceptional in that it contains several short neurones and intervening synapses, which allow an immediate spreading of the nerve impulses, but an example of an immediate spread of the nerve impulse is also found in the "axon" reflex. Certain receptors in the skin give origin to nerve impulses which pass to the central nervous system and at the same time spread along branches of the axis cylinder

of the same neurone to inhibit the contraction of local arterioles. The same neurone is here clearly capable of conveying nerve impulses which have different end-results, and the same receptor must be the source of origin of the nerve impulse. The nature of the ending of the neurone mainly determines the result of the nerve impulse, but it does not follow that all nerve impulses in the same neurone are equally effective in the production of each end-result.

The synapse and the receptive substance at the terminations respectively of the neurone in the axon reflex may be so adjusted that each responds to nerve impulses of different frequency. In the artificial stimulation of vaso-motor nerves the frequency of the stimulus is an important factor in determining the character of the end-result when applied to a nerve trunk containing both vaso-constrictor and vaso-dilator fibres. The point of importance to the present argument is that the same receptor and the same neurone can be concerned with the production of more than one kind of end-result. It appears to us probable that by the branching of the afferent neurone in the central nervous system, and its communication with other neurones similarly branching, the necessary pathways are present for the production of many end-results from the stimulus of a single receptor at the periphery. That the nerve impulse in an afferent nerve does not normally spread beyond certain well defined limits is explainable by the resistance it meets with in the synapses in the central nervous system; but, as will be shown later, the resistance of the synapses can be altered by abnormal conditions and very great spreading of afferent nerve impulses may occur.

The receptors concerned with some forms of sensation are well known, but others—and these unfortunately some of the most important from the clinical aspect—have not been definitely located. The nature and site of the receptors in the skin for the senses of touch, tactile discrimination, heat, cold, pressure, and pain, are uncertain. The histological structures in the skin recognized as receptors have had various functions assigned to them by different observers. They are being made the objects of a special investigation in the Clinical Institute, and a discussion of them is beyond the scope of this article. With the exception of the proprioceptors, so well elucidated by Sherrington, even less is known of the nature of the interoceptors. Some of them can give rise to sensation, notably of pain, but most, if not all, are concerned with the initiation of reflexes.

Many afferent neurones form free nerve endings or arborizations, especially in epithelium, which present no indications of possessing any special form of receptors. Indeed the free nerve endings are themselves regarded as the receptors. They appear to be the only nerve endings in the cornea, and as the sensation evoked by stimulation of the cornea is one of pain it is naturally inferred that the free nerve endings are the receptors for pain. But other effects are produced by stimulation of the cornea—namely, reflex closure of the eyelids and lacrymation. If the cornea be lightly stimulated by a fine wisp of moist cotton-wool no pain is felt but the reflex is produced, and the only sensation is that of the reflex itself. A stronger stimulus, and one that is actually injurious to the epithelial cells on the surface of the cornea, provokes a stronger reflex accompanied by pain. A minute foreign body, if of a harmful nature by reason of its hardness or chemical composition, occasions pain of an intense and widespread character. Similar free nerve endings are found in the skin, but the living cells amongst which they ramify are protected by the dead and horny cells of the outer layers. A stronger stimulus must consequently be applied to the skin in order to produce pain, and the sensation thus elicited is a mixed one because the skin is capable of other sensations. Any modification of the epithelium alters the reaction. The application of a mild irritant soon abolishes from the area affected all sensations of heat and cold and tactile impressions, leaving an epithelium which, like the cornea, responds to all stimuli by reflex action and by the sense of pain. The pain is very like that of the cornea, being unmixed with other sensations, widely spread and incapable of exact localization.

The condition of the epithelium is, in our opinion, of very great importance in the maintenance of function of the receptors in the skin, and we regard the epithelial cells as the true receptors and not the free nerve endings. The free nerve endings lie among living cells in the epidermis. In the epidermis these cells are intimately connected one with another by intercellular bridges of protoplasm. Injury to any cell probably involves a widely spread response, and it may be that the reaction of the cells to the injury furnishes the effective stimulus which results in pain. Whether the actual nerve endings contain a receptive substance or not is unknown. It is quite possible that they do, and that the afferent end of each element in a reflex arc is alike endowed with a material which has the specially developed property of excitability as distinguished from that of conductivity. Such an element is present in the receptor organ of the sense of smell and in the receptive substance of the effector organ of voluntary muscle. In our opinion too little account has been taken in modern researches on sensation of the importance of the receptor and its re-establishment with the ends of regenerating nerve fibres.

THE SENSE OF PAIN.

Many tissues and organs of the body are insensitive to stimuli which in the skin produce pain. This is not because of the lack of afferent nerves, but because the receptors present are not adequate to such forms of stimulation. Most of these tissues are productive of pain when the stimulus is of such a nature as to excite the receptors, although the pain may not be felt in the organ affected but is referred to some other situation which is normally capable of sensation. The only known receptors in voluntary muscle are the muscle spindles, which are chiefly concerned with the initiation of reflex action but may give rise to muscle sense. Muscle is insensitive to ordinary forms of stimulation which cause pain in the skin. Pain of varying degrees of severity can occur in muscle, but it is always associated with some degrees of activity of the muscle, and is probably due to some condition which exaggerates the normal adequate stimulus of the muscle spindles, or renders these receptors more sensitive. The fact that pain in muscle is found to be associated clinically with contraction of its fibres makes it probable that the muscle spindles are the receptors for pain in voluntary muscle. The normal contraction of muscle is painless, but becomes painful when the circulation of blood through it is interfered with.

Pain can also arise from cardiac and involuntary muscle although these tissues are insensitive to ordinary forms of stimulation. Nothing is known about the nature of the receptors in these structures. They appear to be primarily concerned with the production of reflex action, and by analogy one would assume that they are stimulated by the activity of the structures in which they reside. This is found to be so, for pain in cardiac and involuntary muscle is associated clinically with activity of the organs in which it occurs, though some other factor appears to be necessary such as a deficiency in blood supply. It is often stated that tension is the exciting factor in the production of pain. But the term "tension" is apt to be misunderstood in its application to muscle. The function of muscle is to produce tension; the contraction of muscle does not necessarily imply its shortening, but it does imply tension in the muscle, and this tension is probably the adequate stimulus for the receptors in it. The artificial tension of muscle produced by the distension of a hollow viscus gives rise to pain, but it probably does so by stimulating the contraction of the muscle to overcome the distension. Great care is necessary in making clinical observations on the production of pain in the viscera that the results of reflex action—for example, slowing of the heart, vascular changes, faintness, nausea, and other symptoms—are not mistaken for pain.

We are of the opinion that pain in muscle, whether voluntary, cardiac, or involuntary, is always associated with the contraction of the muscle, but that some other factor or factors are necessary and that a deficient blood supply is one of the most important.

We regard pain as a sensation which under certain conditions is superadded to the reflex, and the nerve impulses giving rise to pain we regard as excited by the same receptors and carried into the central nervous system by the same afferent neurones as those which bring about the reflex. Pain may be readily added to the reflex, as in the case of the afferent neurones from the cornea, or more rarely added, as in those from the heart muscle. The harmful stimulus, as has been shown by Sherrington, takes precedence of all others in bringing about its distinctive reflex, even in the spinal animal in which there can be no perception of pain. These observations appear to us to point to the reflex as the more important end-result of the harmful stimulus. In certain cases of injury to the spinal cord where areas of hyperalgesia are found in the skin the slightest stimulation of the latter results in pain. We cannot but conclude that here we are dealing with a central change, and that the nerve impulses excited at the periphery, which in the normal individual would cause no pain, now do so because of their more ready access to the pain tracts in the spinal cord. The actual cause of this increased passage of nerve impulses into the pain tracts appears to us to be explainable by a decreased resistance in the synapses between the endings of the afferent neurones and the dendrons of the neurones which constitute the pain fibres of the spinal cord. We know that the nerve impulses giving rise to pain are carried by fibres which decussate to the opposite side of the spinal cord soon after the impulses have reached the cord, and that this decussation is not made by the incoming afferent neurones. Consequently there must be a synapse intervening between the incoming afferent neurone and the neurone which carries the impulses upwards on the opposite side of the spinal cord. This synapse, guarding as it were the entrance to the pain paths, is of great significance, for it interposes a resistance which is probably very varied for different afferent neurones, and is in each case susceptible to those changes which are characteristic of the synapses in general. So far as we know the afferent fibre on arrival in the lower level of the central nervous system gives off a number of branches and makes connexions with other neurones. Pathways are thus provided for a great many reactions.

It seems to us that neither pain from tissues endowed with common sensibility, nor from the viscera, requires special nerve fibres from the periphery, and that the analysis of the afferent nerve impulses takes place in the lower level of the central nervous system. Pain from tissues endowed with common sensibility becomes educated, capable of localization, and modified by other sensations. Pain from the viscera is comparatively rare, uneducated, unmodified by other sensations, and the nerve impulses which cause it, on coming into the lower level of the central nervous system, excite the same neurones in the pain paths and give rise to pain which is referred to those areas of higher sensibility with which it has by education been associated.

There is, therefore, no necessity to postulate the separate existence of special receptors and special nerve fibres for the sense of pain. It is not indeed reasonable to assume that structures like the ureter and other viscera are provided with special receptors and special nerve fibres to meet a pathological event which may not occur for generations. The stimulus which is adequate to excite pain in the viscera or elsewhere may do far more than this. It sets up nerve impulses which spread widely in the lower level of the central nervous system, and may give rise to nausea, vomiting, sweating, vasomotor, cardiac, respiratory, and other reflexes, or even shock. Pain may or may not occur in association with any or all of these symptoms. Pain is a concomitant very often, but is not the cause.

Pain is one of the most important manifestations of ill health, and when it occurs is of special diagnostic value because the site of its excitation can be more or less definitely located. In this way a clue is given to the site and cause of the disturbance which is not to be obtained from the other symptoms occasioned by the spreading of the nerve impulses in the central nervous system.

PELLAGRA IN CHILDREN IN ENGLAND.

(With Special Plate.)

BY

ROBERT HUTCHISON, M.D., F.R.C.P., PHYSICIAN, AND DONALD PATERSON, M.B., M.R.C.P., PHYSICIAN TO OUT-PATIENTS,

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET.

OUR object in reporting two cases of pellagra in children is to draw the attention of clinicians in this country to the fact that pellagra is endemic in England.

The diagnosis, except in typical cases seen during the spring and summer months, when the rash is well marked, is not easy, and a considerable number of cases probably remain undiagnosed on this account. In 1913 and 1914 Dr. C. R. Box described three cases of pellagra in children, two of them fatal. In one of these cases the pathology was described in detail by Sir Frederick Mott. All of these children had lived throughout life in England.

CASE I.

Edna S., aged 6 years and 10 months, admitted to Great Ormond Street Hospital, April, 1923. The complaint was loss of walking power and shaking of the limbs. This had been noticed for six months. The family history appeared quite normal, no other person being affected. She was breast-fed for six weeks, then put on Nestlé's milk up to 11 months, since when she has had the same food as her parents. She had meat first at 3 years. She had always had plenty of milk, eggs, vegetables, and fruit. She was always fond of "cornflour" and would take nearly half a pint daily. She seemed a healthy child up to the age of 3½ years. She had lived at Little Blackenham—five miles beyond Ipswich—all her life except between the ages of 4 and 5½ years, when she had lived at Walthamstow. She had had "eczema" every year, starting in the spring. It was first noticed to occur after an illness, said to be "meningitis," at 3½ years of age. This illness lasted three months and was accompanied by fever and drowsiness; recovery was gradual. The rash appeared as the child got better. It appeared on the hands, feet, neck, and face. It appeared on the knees last year for the first time. It usually lasted four to five months, appearing first in March. In July, 1922, the child complained of "giddiness," and began to fall about. This came on suddenly, the child falling down when out walking. She did not lose consciousness and the attack lasted one and a half hours. A month later she had two similar attacks.

Present Illness.—The patient was comparatively well until six months ago, when she gradually ceased to walk more than a few steps, and tremor of her hands and arms developed. She walked with the aid of the furniture. She complains of pains in her head which seemed to start at the back of her neck and shoot over her head. Her eyesight failed and she could not recognise objects across the street. She had some frequency of micturition by day and night.

On admission, the child was miserable but well nourished. There were patches of dermatitis on the face, neck, hands and inner surfaces of the arms, knees, and backs of the thighs. The tonsils were large and injected. There was incontinence of faeces. The child had a tremor of her arms and hands. The pupils were equal and reacted to light. No cranial nerve palsy was noted. All her deep reflexes were increased. The plantar reflexes gave a flexor response, and the abdominal reflexes were not obtained. No ankle clonus was elicited. There appeared to be a certain amount of anaesthesia to pin-pricks over the legs and abdomen, but there was no definite distribution and it was difficult to be sure. Her Wassermann reaction was negative. The cerebro-spinal fluid was normal. Her mental condition was very backward and she seemed to have the feeling that she was continually falling. Nothing definitely pathological was made out from an examination of the fundi. The urine contained a few cells and a trace of albumin. The urea concentration test showed a normal output of urea by the kidneys. The blood urea was normal: 37 mg. per 100 c.cm. The rash which was present had the appearance of a dermatitis produced by exposure to the sun. A test meal showed a well marked reduction of the total acidity of the gastric juice. No free hydrochloric acid was present.

The patient was seen by Dr. L. W. Sambon, who stated that the distribution and character of the rash and nervous symptoms were typically those of pellagra. The child became much worse during the first week in May, 1923, and passed into a state of coma and died. Unfortunately no necropsy could be obtained.

CASE II.

Helen S., aged 10 years and 9 months. Admitted to Great Ormond Street Hospital, July, 1922. The complaint was progressive mental deterioration and inability to walk, and in addition a rash on the hands, feet, face, and neck which came in the spring and summer and disappeared in the winter. She has lived all her life at Acton, a suburb of London, without leaving the district. The mother and father are both alive and well. The patient is

FIG. 1.—The hands and wrists in Case I.

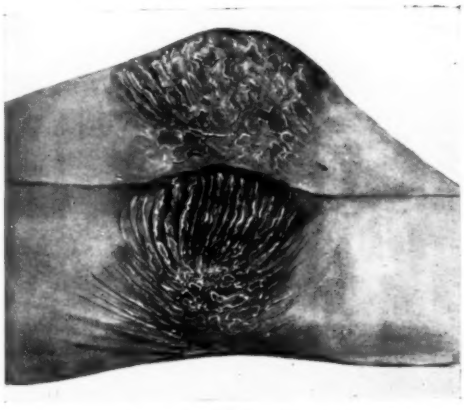

FIG. 2.—The knees in Case I.

FIG. 3.—Appearance of face in Case I.

SYDNEY SMITH AND MOHAMED EMARA: FRACTURE OF SKULL.

FIG 1.—Showing external aspect of bone.

FIG 2.—Showing the internal aspect.

FIG. 1.—Gall stone, seen outside the kidney shadow.

FIG. 2.—Distended gall bladder with stone, seen separate from kidney shadow. (Dr. Hepworth's case.)

FIG. 3.—Lateral view with colon inflation, showing kidney tumour.

FIG. 4.—Normal cystogram.

FIG. 5.—Multiple stones in bladder sacculi. (Mr. Clifford Morson's case.)

FIG. 6.—Prostatic calculi. (Mr. J. Everidge's case.)

the youngest of four children—the others are alive and well. Two of these children are said to have had rickets when quite young. The patient was a full-term child and fed for the first few weeks on the breast. She was then fed on cow's milk and water, on which she developed diarrhoea at the age of 6 months. For the next few months she was fed on a diet consisting of arrowroot, cornflour, and water. For a number of years the child has taken a fairly full diet. The parents are of moderate means and her diet has been that of any other normal child. As a baby she had intractable diarrhoea, since when she has always had to "leave the table in a hurry." Her bowels were inclined to be especially loose in the summer. She has had measles, mumps, and whooping-cough, all when quite young.

Present Illness.—She first walked at 13 months, and her present difficulty seems to have dated from about her fifth year, when she started school. She has progressively become worse since. At one time she seemed quite normal mentally, but in the past three or four years she has become more and more 'childish" and nervous. She has hallucinations of sight and hearing and has a continual fear of being murdered. She is inclined to repeat the same sentence over and over and is fast becoming more and more mentally backward. The rash was first noticed when quite young, perhaps at 3 or 4 years of age; certainly it has been present ever since 1915. Every spring her hands, feet, face, and neck become red and peeling and at times large blisters appear on them. The rash remained all summer. During the period the rash is present all the child's symptoms are aggravated.

On admission she was seen to be a well developed and moderately well nourished child. Her complexion was fair and her hair almost auburn. She had a dull face and it gave one the impression that she was mentally defective at the first glance. The most striking thing about her, however, was a red peeling condition of the whole of the face, neck, and exposed parts of the body, including the hands and feet and shins. In the popliteal spaces there was also well marked peeling. The skin felt harsh in these areas and reminded one of an exaggerated "ichthyosis." At the neck there was a sharp line where the red peeling condition suddenly gave way to the normal white skin. Her mentality would be about that of a child of 3 or 4. She was babyish in her speech and ways. She had marked hallucinations and believed that an attempt was being made to poison her. She was extremely emotional and cried for small things in an unreasonable way. She screamed out at night that someone was trying to cut her throat with a knife, or was trying to poison her. Her reflexes were all exaggerated. The plantars were flexor, and pseudo-clonus was present. The ankle-jerks were brisk. There was no ocular paresis and no ptosis or strabismus was present. Her speech was slow and deliberate. She walked in a spastic manner and with a broad base, and seemed quite unable to lift her feet properly from the ground. As she walked she held her head forward and kept the arms held out from her sides as if to balance herself. Sensation was not impaired to heat, cold, or pain. All the cranial nerves were normal. Her co-ordination with her arms was good.

While in hospital she had recurring attacks of diarrhoea. The stools were loose, offensive, and contained slime and undigested food. At these periods she would lose her appetite. A test meal showed that her gastric acidity was about half that of the normal. Her cerebro-spinal fluid was normal and the Wassermann reaction in both this and the blood was negative. The blood count showed 16,000 white cells present in normal proportions. The urine was normal. An examination of her discs showed no neuritis.

By October, 1922, the rash had completely disappeared. The mental condition showed well marked improvement. She seemed to be walking better. In April, 1923, her mother wrote: "She is still about the same, walking about the house a little, but resting every minute. Her face is already burnt with the sun and peeling again. She continued to improve right up to the beginning of March, but then her legs began to fail and she got tired very easily. She is inclined to dribble her saliva."

When shown at the Children's Section of the Royal Society of Medicine in the latter half of April the rash was not present, as by keeping the child protected from the sun her mother had prevented the reappearance of the rash to any extent. Mentally she seemed improved, but her walking was much the same as it had been ten months previously.

Comment.

In both these cases the rash and affection of the nervous system appear to be typical. Apart from the fact that at some period prior to the onset of symptoms both children were fed on large quantities of "cornflour," there is nothing in the history which would fit in with the various theories of the causation of pellagra. In Case II, at all events, the diet seemed to have contained a sufficiency of protein of high biological value.

These children had both resided all their lives in England and it is probable that the disease is commoner in this country than is at present realized, many cases remaining undiagnosed.

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A CASE OF FRACTURE OF THE SKULL CAUSING DEATH AFTER ELEVEN YEARS.

(With Special Plate.)

BY

SYDNEY SMITH, M.D.EDIN., D.P.H.,

PRINCIPAL MEDICO-LEGAL EXPERT, EGYPTIAN GOVERNMENT SERVICE;

AND

DR. MOHAMED EMARA,

ASSISTANT MEDICO-LEGAL EXPERT.

THE following case is of considerable medico-legal interest:

An Egyptian, aged about 40, when admitted, was said to have been struck on the head with a stick during a quarrel eleven years earlier. He was rendered unconscious and removed to hospital, where he remained for one month and was discharged cured without paralysis or other disability. For eleven years he worked as a labourer without having the slightest trouble.

On May 15th, 1923, while sitting with some friends he suddenly became unable to speak and felt numbness and heaviness in his right arm and leg. There had been no quarrel, no excitement, nor undue exertion. On May 16th he was taken to hospital. He was then semi-conscious, could understand a few words, and responded by indistinct syllables to all questions. There was no squint, no nystagmus, no conjugate deviation. Right arm and leg motionless, muscles not atrophied, no tremors or twitching. Pupils normal.

Superficial Reflexes.—On the right side the plantar, abdominal, cremasteric, and corneal superficial reflexes are all absent. On the left side the plantar is flexor type, corneal and abdominal present.

Deep Reflexes.—On the right side, biceps, triceps, supinator, and wrist-jerks are all exaggerated; knee- and ankle-jerks almost normal. On the left side all are normal.

There are no deformities. Blood pressure: systolic, 100; diastolic, 70, pulse 72, full. Diagnosed right hemiplegia with aphasia and an old depressed fracture on the left side noted.

The patient remained in hospital till June 2nd—that is, sixteen days—and was prepared for operation, when he died. There were no signs of abscess or other septic condition. The temperature was between 37° and 38° C. throughout.

On *post-mortem* examination the limbs on both sides were found symmetrical, no contraction or atrophy being observed. There was a transverse scar 3 cm. in length adherent to the skull over the left side of the frontal bone. Under this was found a depressed fracture of the frontal bone 2 cm. to the left of the middle line measuring 3.25 cm. in the antero-posterior diameter and 3.9 cm. in the transverse, about two-thirds of the depression being on the frontal and one-third on the parietal bone. Its position was slightly above Broca's area and a little in front of and impinging on the Rolandic area. The posterior and lower segment of the wound was depressed to a greater extent than the rest, the floor of the depression gradually sloping upwards to the normal level. The sharp posterior margin was smoothed and rounded. To the right of this depression there was a healed fissure which passed forwards for 5.5 cm. from the fronto-parietal suture. On the right of the middle line on the fronto-parietal suture the frontal bone was raised above the level of the parietal, due to the opening of this suture by the blow, and 5 cm. from the middle line to the right a healed fissure arising from this suture and passing downwards towards the base with an inclination backwards could be seen.

Internally there was a roughly circular depression 4.2 cm. in diameter composed of five depressed fragments and showing fissures which could not be seen externally; there was no callus formation. All the edges were smooth and no signs of sepsis could be observed. (Figs. 1 and 2.) The dura mater was not thickened nor were there any special adhesions. The brain was congested and oedematous and there was a depressed area in the cortex opposite the fracture. The cerebro-spinal fluid was increased in amount. The cortex of the brain appeared normal, but on section the deeper tissues and wall of the left lateral ventricle were found lined with soft pultaceous material, and similar brownish material was found in the ventricle, the cavity of which was larger than the right. The optic thalamus and caudate nucleus appeared very soft and broke up on the slightest touch.

The other viscera, including the kidneys, appeared normal; there was no atheroma to be observed. There was no middle-ear disease or any other septic focus.

The brain was submitted for microscopical examination to the Pathology Department, and Dr. Serour found, in sections from the softened area, foci of sepsis with areas of interstitial haemorrhage and necrosis, and very slight thickening of the blood vessels.

This case appears to be of considerable interest from many points of view—namely, the rapid and apparently complete recovery and subsequent freedom from symptoms with a considerable area of bone depressing the cerebral cortex over the motor area; the rapid onset of cerebral softening without premonitory signs or apparent cause; the extraordinary period intervening between the injury

and onset of symptoms; the nature of the injury itself and the manner of its infliction.

First, as to the causation of the original injury, the appearance of the bones at once shows that a blow from a stick was not the causal factor. The acute, sharp-edged depression of the posterior and lower margin of the main area, the shelving of the floor, and the characters of the floor indicate that a blunt rounded instrument of heavy nature and small striking surface was used. Such weapon was in all probability a hammer or the blunt end of a fass (a kind of grabber used by the fellaheen in their work and a common instrument of offence). The blow was struck from the front by a right-handed man, the weapon being swung laterally. One blow only was struck, the forward drive of the weapon causing bending and compression of the skull, and bursting of the fronto-parietal suture was the natural consequence. The anterior and posterior fissures were caused simultaneously, the first by the bending at the site of impact, the second arising when the opening suture reached a point in the bone where it became thin enough to offer less resistance than the suture. This is a common feature of skull fractures.

Secondly, the rapid recovery after injury with definite pressure on the cerebral cortex is relatively common in this country, and we regularly see cases of fracture of the skull, which in Europe would appear hopeless, in which recovery takes place without sequelae and without medical attention.

Thirdly, the sudden onset on May 25th of aphasia of the right limbs, followed by paralysis of the right side, indicates either rapid damage to both the motor area and Broca's speech centre or to the fibres passing from such areas, and as the softening was most marked about the optic thalamus and caudate nucleus we may assume that the motor and sensory tracts in the internal capsule were affected.

Such a condition would naturally lead to the diagnosis of thrombosis of the middle cerebral artery with consequent softening of the parts supplied. There was, however, nothing to indicate that there was any disease of the vessels whatever, and no reason for either thrombosis or embolism, the slight amount of thickening in the small arterial vessels being quite insufficient to account for thrombosis. The presence of septic foci in the softened area, the localization of this area under the old fracture, the absence of other disease, injury, or other cause, raises the assumption that the old injury to the skull and brain was the cause of cerebral necrosis and death after a period of quiescence of eleven years.

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PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, 1923.

SECTION OF RADIOLOGY AND ELECTROLOGY.

S. Gilbert Scott, M.R.C.S., L.R.C.P., President.

DISCUSSION ON THE X-RAY EXAMINATION OF THE URINARY TRACT.

OPENING PAPER

BY

ROBERT W. A. SALMOND, O.B.E., M.D., Ch.M., D.P.H., D.M.R.E.,
Honorary Radiologist, University College Hospital, and Institute of Anatomy, University College.

(With Special Plate.)

Since the advent of *x* rays urology has undergone an enormous advance in more accurate diagnosis. This advance has only been obtained by the co-operation between urologists and radiologists. In the earliest years of radiology it was thought almost sufficient if a shadow of a stone could be demonstrated; but as years have passed, experience accumulated, and technique made more perfect, very much more is expected of the radiologist, and, in the more obscure cases, the technique has to be much elaborated. For some years only a positive result was of value, but now a negative one is, or should be, of almost equal value. The success of *x*-ray examination of the urinary tract may be said to depend on two main factors: (1) proper technique, and (2) accurate interpretation; the latter can only be got by combining the experience of the radiologist with that of the urologist.

As the technique is so important it will not be unprofitable to deal with it in full. As regards the *x*-ray apparatus, this should be capable of making the correct exposure in a fraction of a second, or at most in two or three seconds. The more rapid the exposure the less time the patient has to bear the compression and the easier it is to ensure immobility of the kidneys with resulting sharpness of outline. If the outfit is not so powerful it is still possible to do good kidney work with longer exposures, provided the kidneys are kept at rest by *proper* compression. Even with rapid exposures it is better to apply some form of compression for the purpose of displacing the coils of intestine to one side or the other, and so giving a less thickness of solid parts to be traversed. A pneumatic bag which can be blown up to various degrees of distension is very satisfactory for this purpose.

If the examination is to be of any value it is necessary that the patient be prepared beforehand. For this two days should be allowed, during which he keeps on light diet and takes an aperient on each of the two evenings preceding the examination, so that the bowels are well cleared out. Early on the morning of the examination an enema should be given and as light a breakfast as possible taken. For the patient's comfort it is therefore better to make the examination early in the day rather than late. As regards the aperient, it does not matter much what is used, although some avoid castor oil as causing too much distension of the bowel with gas. Preparation of the patient, however, should not be overdone, as it is believed that if the intestines are empty and quite collapsed it is more difficult to show the outline of the kidney than if a certain amount of gas is present.

The patient having been properly prepared, one is ready to make the exposure. The tube should be soft rather than hard, with just sufficient penetration to get through the parts. The patient may be lying on his back or on his face according to the radiologist's method of technique. If the patient is supine the film is placed under his back in such a position that the last two ribs and the top of the iliac crest will be included. It is important to observe whether the skin of the back is free from papillomata or scars, and that it is in close apposition to the film. This can generally be managed when the compression is applied, or by some little manipulation, such as raising the knees or shoulders or both.

The tube should be tilted so that its extension tube points under the costal cartilages and thus avoids any calcification which may be present. As the centre of the kidney is normally at the level of the second lumbar vertebra the central ray should pass through this level, so that the kidney outline will show the least amount of distortion. It is immaterial whether both kidneys are done simultaneously on a larger film or whether each one is done separately, but it is most essential that the entire urinary tract of both sides should be done in all cases. Cases turn up every now and then in which the pain from a stone is referred from one side to another, and if both sides are not examined the examination would be more misleading than if it had not been done.

The films of the kidney region should show clearly the whole of the kidney outline, the last two ribs, the transverse processes of the lumbar vertebrae, outer margin of psoas muscle, and part of the crest of the ilium. The writer prefers to use unscreened films, but there is no objection to screens of the first quality such as Patterson's

The slightest markings or "graininess" on a screen make it quite unsuitable for kidney work.

The mid-ureters are next examined, or the whole tract may be done in two sections. Here again a rapid exposure should be made, for although the ureters, or at any rate the greater part of them, do not move with respiration, a shadow, such as a calcified mesenteric gland would cast with respiratory movements, would be blurred. The blurring in itself would be of some significance, but it is better to get a sharp outline rather than a blurred one. The tube should be parallel to the film in this section of the tract.

The bladder region is next examined, and it is of vital importance that the tube is well tilted so that, with the patient supine, the opening of the extension tube points well into the opening of the pelvis. If this is not done small shadows at the base of the bladder and in the prostate or prostatic urethra will certainly be obscured by the overlapping shadow of the pubic arch. If the patient is examined from below and lying prone, it is necessary to "open" the pelvis by putting an air cushion under his thighs. If the patient is screened in this position the clearer view is very striking as compared with that taken when he is lying flat.

This, then, is probably the technique most frequently adopted in routine cases and as a preliminary in the more difficult ones. An improvement of much value is the use of the Potter-Bucky diaphragm, for the results obtained are of much finer quality and of correspondingly greater diagnostic value. If a shadow is found which is rather indefinite, or which suggests that it might be due to intestinal contents, it is usual to repeat the examination in a few days' time after further purgation. If the shadow was due to faeces it is most improbable that it will still be present in the same position on the second examination. It is a very sound procedure to confirm abnormal shadows in the urinary tract unless there seems no doubt at all about their interpretation.

Radioscopy of the urinary tract is of considerable value. Stones, especially the larger kidney and bladder ones, can be seen, but perhaps the chief value of screen work is in determining the relative movement of a supposed stone shadow to that of the kidney and its direction of movement with respiration. This is really the same as the method of taking two films, one on deep inspiration and the other on deep expiration, and comparing the relation of a shadow to one of the poles of the kidney on the two films. Radioscopy is also of great value in the diagnosis of movable kidney. Another use is in the examination of an exposed kidney at the time of operation. Though not often made use of in this country it is of value in certain cases.

We may now pass to the more special technical methods which, although they may not be employed in every case, are nevertheless in everyday use in selected cases. They are specially indicated when it is required to know the exact relation of a shadow to some part of the urinary tract or the shape and size of the kidney itself.

Lateral views of the kidney and ureter are taken, with the patient lying preferably on his back and with the tube at his side. The position of the kidney lies superimposed on the bodies of the first, second, and upper part of the third lumbar vertebrae, but one does not see its actual outline. It cannot be too strongly urged that a lateral view is of the utmost value in the differential diagnosis of shadows in the renal area, especially on the right side. In cases of movable kidney, if the patient is lying on his side the kidney may fall forwards, and it is for this reason that the supine position is recommended as more accurate. Stereoscopic views are also made use of, but the writer thinks that they are not of as much value as antero-posterior radiograms combined with lateral.

Perirenal injection of oxygen or CO_2 consists of injecting the perirenal fat with 200 to 600 c.cm. of oxygen or CO_2 through the loin by a lumbar puncture needle. In very large or stout cases it is of considerable help in demonstrating kidney stones which it would be exceedingly difficult or even impossible to show without its aid, but it is hardly likely to be adopted as a routine measure. It is also of much help in showing up renal tumours. The chief difficulty is getting the point of the needle in accurate position in the perirenal fat, for the amount of this varies greatly in different people.

If oxygen is used the best results are obtained by making the exposure a few hours after the injection, as it has then had time to diffuse evenly. If the exposure is made at once the oxygen is located mostly about the lower pole of the kidney. CO_2, on the other hand, diffuses more readily and is absorbed more quickly, so that the exposure is made at once.

The contraindications for this procedure are dense adhesions around the kidney such as follow an operation. It is a comparatively painless method and is safe, though cases have occurred in which the kidney tissue has been punctured.

Pneumoperitoneum is a method by which oxygen or air is injected through a hollow needle inserted through the anterior abdominal wall into the peritoneal cavity under local anaesthesia. By its means a very well defined shadow of the kidneys is obtained, and it is of special value in the diagnosis of renal tumours. Care should be taken not to mistake the shadow of the spleen for that of the left kidney. With this technique the lateral view is of special value. The patient is put in the prone position with supports under his chest and thighs so that the stomach, intestines, and other organs with mesenteric attachment fall forwards, and the tube is at the side of the couch. This view shows clearly the retroperitoneal structures, and, owing to the falling forwards of the intestines, etc., creates a clear prevertebral space. This is of great value in the differential diagnosis between masses arising retroperitoneally, such as a kidney growth or a psoas abscess, which encroaches forwards on the prevertebral space, and other masses arising from the abdominal organs, which fall forwards and so leave the retroperitoneal and prevertebral spaces clear.

The procedure is unfortunately accompanied by a certain amount of discomfort and is not without danger. I have had one fatal case, due to the presence of minute perforations on one side of the diaphragm which caused a pneumothorax, collapse, and death within a few hours.

Colon inflation is a much simpler method than the two foregoing, and consists simply of pumping in air through a rectal tube. It should be done under the control of the screen, for there seems to be an optimum effect which can only be determined in this way. It is quite painless and free from danger, and is a method worth bearing in mind when there is difficulty in showing up the kidney outlines clearly. If too much air is pumped in one is apt to get confusing shadows from the sacculations of the colon.

An opaque ureteral bougie, passed by means of the cystoscope, is of special value in determining the relation between shadows in the neighbourhood of the ureter and the ureter. When *in situ*, films should be taken in two positions at different angles, and if the shadow is seen in the same close proximity to the bougie in the two films one is justified in assuming the shadow to be a stone in the ureter. In exceptional cases, however, such as hydroureter, there may be a space between the shadow and the bougie and yet the condition be one of ureteric stone.

Pyelography is one of the most valuable aids we have in urinary examination, but the cases in which it is done should be selected. It consists of injecting very carefully an opaque solution into the pelvis of the kidney through a ureteral catheter by a syringe or by gravity. At the present time the solution most in favour is a 10 to 20 per cent. solution of sodium iodide or bromide. Collargol, previously much in vogue, should not be used on account of its irritating properties. It must be admitted, however, that the ideal solution for this work is yet to be found. It is advisable that only one side should be done at a time, and it is safer not to use compression. As its name implies, its special value is in outlining the renal pelvis and showing whether it is dilated or distorted. It also shows the relation of the kidney pelvis to the shadow of a stone already found in the kidney region.

Lateral pyelography is frequently used; here the pelvis is seen as an elongated shadow over the body of the

second lumbar vertebra with the calyces projecting above and below like horns.

Pneumo-pyelography is a similar method to the preceding except that oxygen is used instead of the opaque solution. The advantage claimed is that it does not obscure the shadow of a stone in the kidney pelvis as an opaque solution does. It is also said that the oxygen is more permeable than the solutions, and so will pass a constriction or obstruction more readily. The disadvantage is that any gas in the intestine overlying the kidney may be confused with the oxygen in the pelvis and calyces.

Ureterography is the outlining of the ureter by an opaque solution. It is of value in showing dilatation of the lumen and also kinks. For the demonstration of kinks it is better to withdraw the catheter well down into the bony pelvis and then inject the ureter. If the catheter be left in the ureter it acts as a splint and may obliterate any kink. Some kinks can only be made visible with the patient in the upright position.

In regard to cystography, while occasionally a bladder full of normal urine will show distinctly on the film, one cannot depend on this to show its outline. To demonstrate this it is usual to fill it with some opaque solution, such as 10 per cent. sodium iodide or an emulsion of barium and oil, or even air, although the last is not without its dangers. In this way any filling defect due to a growth inside the bladder will cause an irregular outline. It should be remembered that blood clot may sometimes cause a filling defect. A diverticulum, if it projects above the upper outline of the bladder, will be seen, but films taken at different angles may be necessary. Cystography is of special value in determining the shape and position of the bladder, the presence of diverticula, and the diagnosis of hydro-ureter, with incompetence of the uretero-vesical valve. It is also helpful in the diagnosis of calculi in the prostate or prostatic urethra. The urethra does not lend itself well to the injection of opaque solutions, as it is difficult to maintain any pressure of the fluid.

Before passing to the important question of interpretation and differential diagnosis I would like to state briefly but emphatically that the photographic technique in urinary work probably requires more care and skill than in the examination of other parts.

One has next to deal with the interpretation of the various shadows found in the region of the urinary tract and their differential diagnosis, and also to consider the abnormal shadows of the outline of the kidney or bladder. It will perhaps be best if they are discussed under the headings of kidney, ureter, bladder, and urethral regions.

I. *Renal Area.*

The normal position and size of the kidney should be clearly visualized in one's mind. Its size will, of course, vary with the size of the subject, and it is at present a matter of personal experience as to whether a kidney is thought to be larger than normal. Marked variation in size is found in various individuals, but there is usually very little difference in the size of the two kidneys in the same individual. This is of great help in the diagnosis of enlargement, for any appreciable variation in the size of the two kidneys should be regarded as distinctly pathological. The movement of the kidney in full inspiration and expiration varies from one to two inches in ordinary individuals. It is essential that the outline of the kidneys is shown on the film, for if an abnormal shadow is seen in either loin but clear of the kidney outline, then obviously it cannot be a renal calculus.

Kidney stones are characterized by being seen superimposed on the shadow of the kidney; they move with the kidney on respiration—in other words, they maintain a constant relation to some part of the kidney on expiration and inspirations; they are usually of homogeneous density, and have sharply cut outlines. The horn-shaped stone filling the renal pelvis and the branching stone filling the pelvis and calyces are quite characteristic. If seen on the screen their direction of movement with respiration is downwards and outwards. In the lateral view they are seen superimposed over the bodies of the first to the third lumbar vertebrae, although occasionally a stone may lie behind or just in front of the vertebrae if the kidney is enlarged.

There are other conditions which cause definite shadows in the renal areas and which must be differentiated. The following are the most important:

(*a*) Intestinal contents, including shot from game.
(*b*) Calcified abdominal glands.
(*c*) Gall stones.
(*d*) Calcification in a tuberculous kidney.
(*e*) Calcification in a malignant kidney.
(*f*) Papilloma on skin of the back.
(*g*) Foreign bodies.

Intestinal contents are due to inefficient preparation of the patient, and, unless the patient has been taking bismuth, are usually not so dense or so definite as a stone. The easiest way to clear up the question is to repeat the examination after further purgation. Shot eaten in game have been mistaken for stone.

Calcified abdominal glands may be very confusing, and may be found over any part of the urinary tract. The gland itself is rarely of any size, but when a group is clustered together the shadow may appear like that of one large gland. The density of a calcified gland is not homogeneous but irregular, due to the deposition of the lime salts in the areas of necrosis of the gland. For this reason they usually present a somewhat mottled appearance. They may be nearly as dense as a kidney stone, and are usually denser than a gall stone. The chief characteristic of a calcified abdominal gland is its great mobility. If two separate plates are taken with compression the position of the shadow will almost always be seen to show a great variation; in fact, it may be quite outside the field of one of the two plates. In a lateral view the shadow of these glands is nearly always in front of the vertebrae, but Thurstan Holland has recorded a case where a calcified gland lay against the front of the kidney and moved with it. In such a case it would be exceedingly difficult to differentiate it from a renal stone.

Gall stones are, of course, found on the right side. Their characteristics are a clearer central nucleus with a denser peripheral area; occasionally they are dense all through. The picture of multiple small faceted stones in a distended gall bladder is quite characteristic. Their density is rarely as much as either a renal stone or calcified gland. Under fluoroscopy their movement with respiration is more vertical than kidney stone. It is of immense value to get a film showing the outlines of both the kidney and the gall bladder. In this way alone it is quite possible to exclude renal stone. If the shadow is superimposed on that of the kidney, then a lateral view is of the greatest value in differentiating. A gall-stone shadow is well in front of the vertebral bodies, whereas a renal stone is usually level with the bodies or behind them. A lateral in conjunction with an antero-posterior view is of more value than stereoscopic in the diagnosis between gall and kidney stones.

Calcification in a tuberculous kidney shows as an irregular calcification in its substance. It is rarely so dense or so well defined as stone, and usually the kidney outline will be seen to be enlarged.

Calcification in a malignant kidney is more rare, and presents much the same appearance as the last mentioned. The outline of the kidney will almost certainly be enlarged and its regular bean shape altered by the growth.

A small papilloma or wart on the back may cause a shadow exactly similar to that of a stone. Previous inspection should prevent any error.

With regard to foreign bodies, I have seen more than one case of a piece of shrapnel which had been thought to be a stone in the kidney. We had a case at hospital two years ago which was diagnosed by *x* rays as a stone in the kidney, and on operation was found to be a piece of shrapnel partly embedded in the kidney tissue and partly free in the renal pelvis, the latter portion having become encrusted with phosphatic deposits.

II. *Ureteric Region.*

The normal position of the ureter is along or just internal to the tips of the transverse processes of the lumbar vertebrae, from the second down to the sacro-iliac

sychondrosis, then downwards and inwards towards the base of the bladder. When a stone obstructs the ureter its position may become greatly altered. Stones in the ureter are usually of a small size, of an elongated oval shape, and lying in the line of the ureter. If the ureter is much dilated the stone or stones may be very much larger. The larger the stone, the more the ureter tends to run external to the transverse processes. Stones may travel forwards and backwards from the renal pelvis to the lower end of the ureter, but not from the bladder back into the ureter. For this reason a film should be taken on the day of operation if the *x*-ray examination was made some days previously. A frequent site for a ureteric stone is at the entrance into the bladder, where it seems to be held up before passing through the orifice.

The following conditions may be mistaken for ureteric stone:

(*a*) Calcified abdominal glands.
(*b*) Accessory epiphysis for the tip of the transverse process.
(*c*) Concretion in the appendix.
(*d*) Calcification of the iliac artery.
(*e*) Calcification of the sacro-sciatic ligament.
(*f*) Phleboliths.

Calcified abdominal glands. (See under the kidney area.)

An accessory epiphysis for the tip of the transverse process will lie in the line of the ureter, but its base, fitting exactly to the rest of the transverse process, should make one suspicious. A small ureteric stone may, however, be completely superimposed on the shadow of a normal transverse process.

A concretion in the appendix or the stump of an excised appendix treated with iodoform paste may lie in the line of the right ureter and present a shadow suggestive of stone. An opaque bougie with films taken at two angles should help to differentiate.

Calcification of the iliac artery may occur in the line of the lower part of the ureter. The lime deposit is wavy in appearance and should not be mistaken for stone.

Calcification of the sacro-sciatic ligaments is streaky in appearance, and not like that of stone.

Phleboliths are often liable to be mistaken for ureteric stones, and in some cases it is difficult to differentiate. They may occur, as age advances, without any pathological significance, and are due to the formation of small calcareous nodules in the pelvic veins. They show as small rounded shadows along the sides and lower parts of the pelvis. At times they are oval, and are then more likely to be confused with stone. Frequently one or more are seen near the ischial spine. They are distinguished by being usually external to the line of the ureter, are generally rounded in shape, and usually multiple. An opaque bougie is often necessary to differentiate them, with two views at different angles. Even this is not infallible and it may be necessary to take two films—one with a soft pliable opaque bougie which adapts itself to the pelvic curve of the ureter, and the other with a rigid metallic dilator which straightens it out.

III. *Bladder Area.*

The position of the bladder is well known, but it should be clearly realized that its base is below the level of the pubic arch, so that a true antero-posterior view will not give a clear view of its lowest part. As already stated, the tube or the patient should be well tilted to avoid the pubic arch. Vesical calculi are usually larger than kidney or ureteric ones, are generally rounded or oval in shape, and may show different densities owing to the deposition of layers of different chemical composition. At times a typical vesical stone or group of stones may be encountered in an abnormal position, and it is then well to consider if they are in a diverticulum of the bladder. In the diagnosis of a diverticulum opaque solutions are used, with films taken at different angles. The patient then voids, and another film taken will show the amount of retention. Diverticula are of considerable etiological importance in the formation of stone. The diagnosis of stone in the bladder is usually easier than in renal or ureteric stones owing to their size and relative immobility of the organ in the pelvis. The following conditions may, however, have to be differentiated:

(*a*) Prostatic calculus.
(*b*) Faecal masses in the rectum.
(*c*) Calcified fibroid.
(*d*) Phleboliths.
(*e*) Dermoid cyst containing opaque material.
(*f*) Calcification of seminal vesicles.
(*g*) Foreign bodies.

Prostatic calculi are much commoner than is usually supposed, and it is thought that many have been overlooked by the overlapping of the pubic shadow. They are seen lying very low in the pelvis, and may be single or multiple. If the latter, they usually show a radiating appearance from the mid-line. They are usually not so large nor so dense as vesical calculi.

Faecal masses in the rectum are not so dense as stone, and should not be mistaken for them. They are due to inefficient clearing out of the bowel.

Calcified fibroids show as large, dense, irregular masses, but should not be mistaken for stone in the bladder.

Phleboliths are usually external to the bladder, and from their small rounded shape and from usually being multiple they should not be confused with stone.

A dermoid cyst containing opaque material, such as a tooth, may be mistaken for a stone.

Calcification of the seminal vesicles, due to old age or tuberculosis, may cast a shadow which has been confused with stone in the bladder.

Foreign bodies in the bladder, especially in the female, have been mistaken for calculi, or phosphatic deposits on them may have turned them—from a practical point of view—into stones.

IV. *Urethral Area.*

For the detection of urethral stones it is of even more importance than in bladder work that the tube should be well tilted to avoid the shadow of the pubic arch. These stones may either have formed higher up and become lodged in the urethra, or they may have formed in the urethra itself or in some cavity communicating with it. The most common site is in the prostatic urethra, and these are frequently due to prostatic calculi forming pockets in the gland which tend to establish communication with the urethra. A urethral stone may, however, be found in any part of the urethra, and is then usually due to a stricture impeding its downward passage; not only is it held up but its size may be increased by phosphatic deposit from the unhealthy urine.

The investigation of conditions of the urinary tract other than stone demands careful and elaborate technique, for here one has to depend largely on the outlining of the soft organs. Probably not so much information regarding the shape and size of the kidneys is furnished as might be in ordinary routine examination. If the outlines of the kidneys are seen as they should be, then the report should include some information as to their size and shape. Their position as seen on films is not so trustworthy, because if compression has been used it is more than likely that this has had some effect and a movable kidney may be pushed up into its normal position. With films of good quality it should not be very difficult, with experience, to say whether a kidney appears enlarged and whether its shape is normal. It is possible, in conjunction with the clinical notes, to make a fairly accurate diagnosis of pyonephrosis simply by the routine method, especially when the shadow shows increased density from inspissated pus with deposition of lime salts.

For more accurate diagnosis of these conditions further technical methods are required, such as pneumoperitoneum or perirenal inflation, to show up the kidney outline, or pyelography to show the size and shape of the pelvis and calyces of the kidney. The normal outline of the injected pelvis is well enough known not to require description, and when it becomes distended it presents a more globular shape and the calyces become more elongated. The pyelogram is undoubtedly one of our greatest aids in making the diagnosis of pyonephrosis and in determining

the amount of destruction of the kidney. In large hydronephrosis the pelvis should be drained before injection, otherwise the injecting fluid becomes diluted. Pyelography is also the best method in the early diagnosis of kidney tumours. As, however, pyelography is the subject of a special paper by Mr. Ogier Ward, it is unnecessary for me to enter further into it.

Pneumoperitoneum is also of great help in the diagnosis of enlargements of the kidney. The importance of the prone position and lateral view for the diagnosis between tumours and masses arising retroperitoneally and those intraperitoneally has already been mentioned. In the antero-posterior view also the kidney outline is well seen, and there may be uniform enlargement with regular outline as in cases of compensatory hypertrophy and certain types of nephritis. The enlargement may be uniform, but with a smooth nodular outline, as in polycystic kidney or secondary carcinoma. One or other pole may be enlarged with the regular outline maintained, as in some cases of hypernephroma, or the enlargement may be irregular, as in sarcoma or other cases of hypernephroma.

Perirenal and colon inflation are other techniques which are of value in demonstrating variations in the outline of the kidney.

Having discussed the various methods at the disposal of the urologist and radiologist, and the differential diagnosis of the various shadows found in or about the urinary tract, one may now try to estimate the present-day value of *x* rays in the examination of this tract. This may be prefaced by stating that it should be constantly borne in mind that a uric acid stone will probably not cast any shadow to *x* rays, and although this is well known to radiologists it is perhaps not so frequently stated in their reports on negative cases as it might be. All other urinary stones show a definite shadow. Calcium oxalate stones show the densest shadow, then the phosphatic ones, and lastly the urates. There still occasionally seems to be a mistaken idea that the more rare cystin and xanthin calculi do not show, but even when almost pure they show quite a definite shadow, due to the sulphur element in their composition. It is probably not of much importance to attempt to diagnose the composition of the stone; it is of far greater value to be able to say with accuracy whether a stone is present or not, so far as *x* rays can go.

Another idea which seems to be prevalent is that urinary stones are rare in childhood. According to statistics this is not so, for the presence of stone in childhood and infancy is frequent. Some of these stones are known to have remained symptomless for some years, and it is likely that certain of the stones found in adults have had their beginnings in the early years of life.

All *x*-ray examinations of the urinary tract should be done so carefully that a negative opinion as regards stone may be, in the radiologist's mind and conscience at any rate, of real value—bearing in mind, of course, that such an opinion does not exclude a uric acid stone. Fortunately, however, uric acid stones rarely grow large enough to become of surgical importance.

With proper technique, if necessary with the help of one or more of the more elaborate technical methods, and with accurate diagnosis in collaboration with the urologist, there is no doubt that the value of *x* rays in urinary diagnosis, especially as regards the presence or absence of stone, is of the very highest importance. Most surgeons and urologists who have worked in conjunction with the radiologist and so made full use of *x* rays, will fully bear this out. There have been many mistakes in diagnosis by *x* rays, and there probably always will be some, as in every branch of medicine and surgery. It might, however, be pointed out that some of the shortcomings of *x* rays in this work would probably be avoided if only a closer relation existed between the clinician and radiologist. This lack is more noticeable in hospital than in private work. Radiology is indeed inseparably connected with urinary diagnosis, for although the eye, by the aid of many ingenious contrivances, has penetrated into many of the hidden parts of the body, yet it cannot possibly hope to penetrate everywhere as can *x* rays.

GENERAL DISCUSSION.

Mr. R. OGIER WARD (St. Peter's Hospital, London) dealt with the subject of pyelography and cystography. He said that there was a general feeling, not so much amongst radiographers as amongst medical men in general, that the making of pyelograms involved a difficult, painful, and dangerous procedure. He was sure that radiographers who saw the work done would disagree with that idea. It was more correct to say that the work was tiresome to the radiographer, because pyelography required more time and trouble than a simple skiagram of the kidneys; it was tiresome to the surgeon, because he had to get a good deal of apparatus together; and it was tiresome to the patient, because a cystoscope had to be passed; but it was not really more than that. It should not be painful, as the modern cystoscope was a slender instrument, and if in difficult cases a cystoscope such as that which was used for children was employed the passage of it through the urethra produced very slight discomfort, particularly if a little novocain were introduced first. He considered that an anaesthetic should not be used, because one of the chief indications as to the filling up of the renal pelvis was that the patient complained of a discomfort in the loins, at which stage it was known that the dangerous limits were being reached. If the operation was done under an anaesthetic it was very difficult, unless one waited for the patient to come round, to fix the kidney sufficiently to obtain a satisfactory *x*-ray picture, and to wait for the patient to come round was rather tedious. There was no particular disadvantage in doing the operation under an anaesthetic if a special apparatus was used, such as Pannett had recently described, where the pressure of fluid which was passed into the renal pelvis could be very accurately regulated; but on the whole it was much better not to use an anaesthetic at all. He usually employed 20 per cent. sodium bromide warmed to about body temperature. He ran it in by joining a glass syringe on to the end of the ureteric catheter. It was important not to put on too great pressure; very serious accidents had happened in the past from that cause, particularly when an attempt had been made to perform the operation under anaesthesia. Pyelography had many obvious uses in urinary surgery, but perhaps its most important value was that it gave information of the condition of the kidney and its pelvis which could not be obtained by any other means. Mr. Ogier Ward, in conclusion, exhibited slides illustrating the value of pyelography.

Dr. L. A. ROWDEN (Leeds) drew attention to one point in the diagnosis of renal calculus—namely, the importance of screen examination combined with palpation. He considered that not sufficient attention had been drawn to this in the past. In the corresponding Section at the Annual Meeting of the Association in London in 1910 he drew attention to this matter.[1] Speaking of the radiographic prints which were hanging in the room illustrating the urinary tract, Dr. Rowden said that he was certain he could have seen on screen examination, with proper technique, every shadow that he saw on those prints. That was rather an astounding statement to make, but he had been careful to qualify it by the words "with proper technique." First of all, it was necessary that the tube should be a Coolidge tube, so that it was possible at any moment to alter the penetrating quality of the rays to suit the case under examination. Secondly, it was absolutely essential that the tube should be brought as close to the patient as possible without sparking on to the patient. Thirdly, the eyes of the observer must be properly prepared for the examination. The examination was conducted always with the patient lying on the couch in a horizontal position. The diaphragm was not a mechanical one, but a fixed one, less in size than the area of a postage stamp, and by preference it should be tubular. The box which contained the tube should have free movement up and down and crosswise, but he desired particularly to emphasize the fact that the tube should be as close to the patient as possible. By that means it was astonishing what could be seen on the screen when the

[1] L. A. Rowden: The Value of Screen Examination in the Diagnosis of Renal Calculus, BRITISH MEDICAL JOURNAL, August 27th, 1910, p. 531.

urinary system was examined; in fact, one of his greatest difficulties in the past had been the differential diagnosis of the shadows which were visible. With the aid of the blackboard Dr. Rowden then proceeded to describe his methods in more detail. He concluded by saying that the object of his remarks had been to draw attention to a method of radioscopy together with palpation which simplified the present methods both in regard to time and cost, and which would, he thought, take the place very largely of photographic work, especially photographic work in the transverse direction, from which it was often extremely difficult to get good results.

Dr. G. B. BATTEN (London) said that he would have liked Dr. Salmond to have included in his paper some further reference to the very valuable method, one of the greatest developments in urinary work, followed by Dr. Carelli, of Buenos Aires, and expounded by him eighteen months ago to the Section of Radiology of the Royal Society of Medicine.[1] It depended upon the perinephritic injection of oxygen or carbonic acid gas.

Dr. JAMES METCALFE (London) said that the whole question of the radiography of the urinary organs depended crucially upon the technique employed, and personally he would certainly depend upon films to get an accurate knowledge of the conditions. No eyes could be as sensitive as the x-ray emulsion. He agreed with Dr. Batten in thinking that one of the greatest developments in urinary work was the method elaborated by Dr. Carelli, of Buenos Aires. A year or two ago he saw Dr. Carelli apply this method in a case at the French Hospital in London. The extraordinary clarity of the picture which was obtained with the perinephritic injection of oxygen or carbonic acid gas was so remarkable that it must mean a great improvement in the present methods of diagnosis. When one could see the suprarenal body quite distinctly and judge as to its condition and as to the presence of extraneous growths and other things of a like character, one could not but think that the method must come very largely into vogue in this and in other countries. Dr. Carelli could apparently make his injections with absolute safety, and had no trouble of any kind whatever. Another valuable improvement lay in the use of the Potter-Bucky diaphragm. An extraordinarily large proportion of the people affected with kidney calculi and disease of the kidney were very stout people, and although he had heard a prominent radiologist say that, with the use of compressive methods, he could squeeze even the stoutest person into a sufficient thinness for this purpose, this was not so readily done in a good many cases, the people objecting very strongly to such compression as that. The Potter-Bucky diaphragm certainly eliminated a number of the disturbing shadows, and, with very little compression, furnished a picture of great clarity which made diagnosis infinitely easier. In the speaker's opinion the whole subject was in a state of flux at present, though it was true that great advances were being made which in the course of time would enable medical men to say with the greatest accuracy to what the condition was due—whether a calculus or disease or some extraneous trouble.

Dr. R. M. BEATH (Belfast) referred to one class of case in which pyelography was of great value. One came across a good many cases where the symptoms were such that one would expect to find a calculus either in the kidney or in the upper part of the ureter. Clinically the condition seemed very much like that of calculus, and yet nothing could be seen. When, however, a pyelogram was taken a very definite kinking of the upper part of the ureter would be found, not due at all to the bending of the catheter in the ureter. On operation those cases were found to have a definitely abnormal renal artery crossing the ureter and compressing it. In two or three cases which had been followed up a division of that abnormal renal artery had completely relieved the symptoms. That was a condition which he did not think could have been shown except by a pyelogram.

[1] X-ray Diagnosis with Artificial Pneumoperitoneum and Perinephritic Emphysema, BRITISH MEDICAL JOURNAL, December 17th, 1921, p. 1037.

The PRESIDENT (Dr. Gilbert Scott) said that the success of x-ray examination of the urinary tract depended, first of all, on proper technique, and, secondly, on accurate interpretation. Interpretation was rendered easier if the technique was correct. He did not think that Dr. Salmond had laid quite enough stress on the importance of attention being paid to minute or apparently unnecessary small technical details. Two of the most important of those details were the preparation of the patient and efficient compression. As to the respective merits of films and screen examination, personally he preferred films, but if one used intensifying screens for kidney work one should be sure that one did not overexpose. It was much better to have a definitely underexposed plate if the intensifying screen was being used for kidney work. All sorts of weird shadows would be found on the plate if there had been slight overexposure. It was important that the plates should be carefully examined in proper lighting. He desired to lay stress on the value of showing the shadow of the renal outline. He did not think that pyelography was used to anything like the extent it should be. Mr. Ogier Ward considered it a laborious and troublesome affair, but personally the speaker was able to do the whole operation in half an hour. It depended, to a certain extent, on the surgeon; the surgeon must co-operate, but if he was expert in passing the catheter without delay the whole thing could be done in half an hour. There must, however, be absolute co-operation. Pyelography was of extreme value, and he did not think the surgeon used it to anything like the extent he should. With regard to the matter of perirenal inflation, he had been rather disappointed. He could not persuade the surgeon to take it up, and he could not do it himself, as he did not think it was for the radiologist actually to place the needle and pump in the air. He thought it ought to be considered as an operation. He had been trying to persuade many surgeons to do it, but they would not; they said that the danger of penetrating the artery was too great. His own view was that, if ordinary precautions were taken, there would be no danger, and it would be of great value in certain cases. He desired to ask Mr. Ogier Ward whether, after using his 20 per cent. of sodium bromide, haematuria had occurred in any of his cases. It had been reported to him that sodium bromide did tend to cause haematuria after it had been used. He agreed with Dr. Rowden that the screen examination was not sufficiently used. Personally he used a screen examination after he had seen a suspicious shadow on the plate. For further investigation screen examination was invaluable. He did not quite agree that every case should be dependent on screen examination only, because he had seen faint shadows on a plate, and on screen examination had absolutely failed to find them. Although he knew exactly where they were, he could not see them. Therefore he had come to the conclusion that while in ordinary work screen examination would certainly be quite reliable, in very fine work a shadow, possibly of vital importance in the diagnosis, might easily be overlooked. At the same time, screen examination was of extreme value, and to his mind was not used sufficiently. He thought it was not enough appreciated.

Mr. OGIER WARD, in reply to the President's question, said that he had not come across any case of haematuria in his hospital resulting from the use of 20 per cent. sodium bromide. Dr. ROWDEN said that his method was to screen first, and then to radiograph in the old-fashioned way.

Dr. R. W. A. SALMOND, who also replied, said that the remarks and criticisms of the President of the Section were very welcome, as Dr. Gilbert Scott was well known to be a past master in this branch of radiology. The speaker, however, did not agree with him that proper compression did not immobilize the kidney, because in earlier days it was possible to demonstrate the sharp outline of the kidney with an exposure too long for the patient to hold his breath and with only compression as a help. With regard to the relative values of ureterography and opaque bougie, he agreed that the former was the more important. He was greatly interested in Dr. Rowden's remarks in advocacy of screen examination with palpation, and he had no doubt whatever

that in Dr. Rowden's hands this had given most valuable results; he could not feel, however, that it should be adopted as a routine, but rather as a procedure to be followed after the films had been developed, and some doubtful point remained to be cleared up. He could not agree that the majority of gall stones as seen in films of patients showed a homogeneous shadow; in his experience there was usually a denser periphery producing a somewhat ring-like appearance. He was very pleased to hear Mr. Ogier Ward praising pyelography so highly; it was gratifying also to hear the same speaker advocate lateral views, which some others had spoken of rather disparagingly. As Mr. Ogier Ward had pointed out, lateral views would often avoid the necessity of making a pyelogram. He entirely agreed with the remarks of Dr. Metcalfe and Dr. Batten on the advantages of perirenal injection and the Potter-Bucky diaphragm.

DEMONSTRATION.

The Silhouette Radiograph.

In the Pathological Museum in the course of the meeting Mr. A. P. Bertwistle (Resident Surgical Officer, General Infirmary, Leeds) gave a demonstration of a simple method which he had devised for the more ready interpretation of prints from *x*-ray negatives. Owing to the inability of printing papers, especially bromide, to indicate a structure whose density is so slight as that of flesh, *x*-ray prints commonly show no trace of flesh outline, although such outline may be clearly indicated on the negative. To bring out the skin contour without the sacrifice of the definition of the bone is a matter of some difficulty. The demonstrator has adopted the simple expedient of scratching the skin outline on the negative—in the case of a film, scratching both sides—with a pin before printing. The result in the print is a black line corresponding to the contour of the part. The background in the print is then filled in with Indian ink, thus completing a silhouette radiograph.

The silhouette radiograph has for its object the correlation of clinical findings with those of *x* rays. It is a shadow of flesh and bone, not of bone only, as in the ordinary printed radiograph. After some experience of silhouette radiographs, Mr. Bertwistle said that one could very well predict from the surface appearance what the radiographic findings would be. Certain deformations became immediately indicative of conditions of bone. The bulbous finger-tip, for example, often revealed a periosteal whitlow, and a spindle finger indicated tuberculous dactylitis, both alterations being typical. The "wave" deformity of the arm meant a "greenstick" fracture of the radius and ulna. An injury to the knee, followed by loss of extension and a transverse groove over the site of the patella, made it probable that there was a fracture of bone. Similarly in an injured hand which was radially deviated and displaced backwards in the "dinner-fork" position, it was easy to visualize an impacted fracture of the radius, with marked displacement of the lower end. One of the points in the diagnosis of tuberculosis of bone was the extreme wasting of the surrounding muscles which accompanied the condition. Rachitic and malignant diseases were not accompanied by such wasting, nor was osteomyelitis, in which condition irregularities due to sinuses were frequently apparent. The relation of swellings to bony changes was readily demonstrated by this method.

An important use of the silhouette radiograph was its indication of the position in which the limb was *x*-rayed. It gave the observer his bearings. The demonstrator suggested that the scratching of the negative in the manner he had indicated, before the print was made and dispatched, would greatly increase the value of the print to the practitioner who asked for it. Again, from the point of view of the publisher, the addition of the black background enhanced the bony definition and gave the picture a more finished appearance. It enabled him to print several illustractions of different density on the same page without producing an inartistic effect. Moreover, the clean-cut silhouette was easier to obtain and often revealed more than the mediocre photograph. For example, an encephalocele so treated indicated both the tumour and the defect in the skull. The geography of sinuses was readily ascertained by this method; a sinus into which a probe had been passed or bismuth injected would show the relation of its terminations to the skin. A foreign body, instead of appearing in a state of vague suspension, would assume a reasonable situation. Altogether, the addition of the silhouette imparted reality to the radiograph, a factor which would assist in diagnosis and treatment.

The demonstrator expressed his acknowledgements to Dr. L. A. Rowden of Leeds for his interest in the work, and to Dr. Scargill and the radiographic staff of the General Infirmary for the preparation of material.

SECTION OF OPHTHALMOLOGY.

Sir John H. Parsons, C.B.E., D.Sc., F.R.S., F.R.C.S., President.

DISCUSSION ON OPHTHALMOLOGY IN ITS RELATION TO THE NAVY, ARMY, AND AIR FORCE.

OPENING PAPERS.

I.—Air Commodore DAVID MUNRO, C.I.E., R.A.F.M.S.

Some Eye Problems Special to the Services, with Particular Reference to Flying.

With the advent of flying the functions performed by the eyes in co-ordinative movements have assumed particular importance. To the cricketer whose eye is not "in" nothing worse than a "duck" can happen; to the aviator it may mean anything from a bad landing to a fatal "crash." A single-seater service aeroplane approaches the ground to land at a high speed, and to perform the evolutions required in landing the pilot has to alter the course of the machine from the gliding angle at which it is descending to a horizontal position—what is called "flattening out." He has to judge the exact moment at which to "flatten out," and the judgement is dependent on his estimation of the pace of his machine in relation to its distance from the ground. If he flattens out too high up he will lose flying speed before he reaches the ground, and gravity—the vertical component of the parallelogram of forces which is producing his diagonal glide—will take the upper hand. The machine then will fall vertically in the latter part of its course. If he neglects to flatten out till too late he will fly into the ground at an angle.

This correct estimation of pace and distance seems to depend on "eye" exactly as in games the estimation of pace and distance in hitting a ball depends on "eye." What does "eye" in this connexion mean? Doubtless in the act of landing an aeroplane, just as in other complicated co-ordinative acts, the brain takes note of afferent stimuli other than those which it gets through the eye.

Tactile sensation from the skin through the pressure of the wind on the face assists the pilot for an estimation of pace, also pressure of body against seat of machine. Muscular sense also is of the highest importance; as in riding, "hands" make all the difference. The sound of the engine tells its tale to the man who knows, yet in the main it is through the eye that the brain gets information and makes its controlling judgement.

Briefly we affirm that for a pilot it is necessary that the whole optic tract should be functioning normally. We lay stress on good visual acuity in both eyes, for two emmetropic eyes are more likely to work together than two eyes of unequal refraction; but we lay most stress on the co-ordinative machinery by means of which accurate binocular vision is automatized. Inequality in function between the two eyes we regard as dangerous. Hence I venture to say that while there may be many good players of ball games who have indifferent visual acuity there are few if any who have any marked degree of inequality in functions between the two eyes.

The essentials for good binocular vision would seem to be:

1. Correct co-ordinative movements of the eyeballs as performed by the extrinsic ocular muscles.
2. Unison in the associated movements of convergence and accommodation as performed by both extrinsic and intrinsic muscles.

3. An optic tract which transmits faithfully the two retinal pictures which the brain has to fuse.
4. A cortex which forms concise pictures of the two retinal images—that is, what is known as good fusion sense.

A man who is suffering from imperfect co-ordinated action of his extrinsic ocular muscles is said to be heterophoric—in extreme cases he squints. Many men, probably the majority, have one eye that lags behind the other to a greater or less degree in co-ordinated movements. It is part of what we mean when we say a man has a "master eye." But it is not all—to find the cause of his heterophoria one must go back probably to infancy. One eye begins by being better than the other, and the worse eye gets careless and "neglects." No one, I suppose, can explain why one eye is born worse than the other or in what developmental fault the difference consists. It may, I presume, be one or more of several parts of the machinery which are defective.

Whatever it is, if there is inequality the better eye tends to do the work. Thus to us the word "heterophoria" connotes more than merely "latent squint," an unequal action of extraocular muscles moving the eyeballs. It means some of the above conditions are causing bilateral disharmony.

Thus in the treatment of heterophoria we aim not only at exercising eye muscles—for example, by use of the amblyoscope—but also at re-educating neglecting eyes and teaching them to observe—for example, by Wells's stereoscopic charts. In our view a man with one eye, or with one totally neglecting eye, who has learnt to judge stereoscopically by other means—namely, experience of distance, light and shadow, parallax, or alternating head movements—is less dangerous than a two-eyed man whose one eye only occasionally strikes work.

To Wing Commander Clements (ophthalmic specialist to the R.A.F.) belongs the chief credit of realizing the importance of orthophoria amongst aviators. Under his supervision organized treatment is undertaken in the R.A.F. for flying personnel suffering from heterophoric conditions. Bad landers, suffering from manifest signs of heterophoria, are sent to the school. The results so far encourage us to believe that real improvement is effected. Indeed, we *know* that real improvement has been effected in a number of cases of heterophoric bad landers, but we have not yet got controlled statistics to show how far this improvement can be definitely proved to be due to the methods of eye training pursued, and to those only—or as to how long improvement is maintained.

The effects of glare are also of great importance in connexion with heterophoric conditions. No doubt the importance of these conditions is not confined to air force flying, but in the other services those engaged in work such as range finding have to be watched similarly. I know that it has been considered in the navy.

Recent experience seems to show that for the pilot the most important effect of glare is to cause lack of convergence and accommodation, thereby making visual judgement difficult and causing difficulty in landing. The other effects of glare, such as retinal asthenopia, headache, conjunctivitis, etc., being later and more obvious effects, were not of such immediate importance to the pilot. According to the *Report on Glare in Egypt* by Squadron Leader Rippon in which 150 cases were dealt with, supported by orthotelemeter examination, and to Flight Lieutenant Livingston's reports on some 50 cases in India, the main effects were: (1) fatigue of the ciliary muscles; (2) lack of convergence and accommodation associated in some cases with spasm of accommodation; and (3) aggravation of any existing imbalance of ocular muscles. It was emphasized that the chief effects of glare were produced on the ground and only became dangerous factors when the pilot went into the air.

II.—Wing Commander CECIL CLEMENTS, R.A.F.M.S.

Judgement of Distance.

The part played by the eyes in the judgement of distance has always keenly interested me, and in the British Medical Journal of December 8th, 1906, I called attention to errors of vision as a factor in motor-car accidents.

Observation before the war of private and hospital patients engaged in certain occupations showed that in every case their disabilities were associated with ocular muscle imbalance and by employing a modification of existing treatment with the "Worth-Black" amblyoscope and the stereoscope the normal balance was again restored without recourse to prisms or glasses, and when this was attained the associated physical symptoms vanished.

During the latter part of 1916, as ophthalmic specialist to the 4th Northern General Hospital, I came into contact for the first time with large numbers of officers and cadets of the flying services. It became increasingly evident on examination that these same conditions were present in those officers and cadets whose judgement of distance was faulty, and also in a certain number of gunnery officers complaining of similar symptoms.

Investigations at the flying schools revealed the fact that 80 per cent. of all crashes in training squadrons occurred whilst landing machines. An independent inquiry by Graeme Anderson gave almost identically the same figures in two different series, while Rippon found the proportion was 65 to 70 per cent. at Hendon Aerodrome.

At this time I had no special experience of flying and knew little of the visual requirements of aviation. Permission was therefore requested and obtained to study such conditions. It was found that, of all parts of elementary flying instruction, "landing" provided the greatest difficulties, and that these increased with the newer types of machine which, owing to increased engine power, landed at greater speeds.

The conclusions arrived at were:

1. Correct judgement of distance was a necessity in aviation.
2. That failure to land machine correctly was mainly due to faulty judgement of speed and distance, which was associated with lack of ocular muscle balance and with poor binocular vision.
3. That from financial consideration alone apart from injury to pupils and pilots it was uneconomical to train such pupils owing to (*a*) damage to machine, (*b*) waste of instructors' time, unless something could be done along the lines of my previous experience to help these bad landers to do better, and thus enable them to continue their training and to remain in the flying services, which were then urgently in need of men to meet the combination of war wastage and expansion.

The following is a brief description of the routine tests used to discover and estimate these ocular conditions which I will not label as "heterophoria" and so wander into discussion of definitions, but will simply designate together as "X."

Test for Convergence Power.—Hold a pencil in front of the patient at about 1 foot from his eyes, with point on a level with the root of his nose. Tell him to fix the point, then steadily move it forward, watching what happens to his eyes as they converge. What may happen is: (1) Both eyes may converge, fixing the pencil until it gets within an inch or two from the root of the nose—that is, no want of convergence. (2) One eye may continue to fix up to an inch or two from the root of the nose but the other will cease to follow and may turn outwards at any distance from the nose—he may or may not see double. (3) On convergence breaking down neither eye may fix and he may look into the distance stating he sees double anywhere inside 10 inches; further, he may resist by throwing back his head and complaining that it hurts him. In No. 2 he has learnt to become monocular and such a response is taken to mean that he has had the trouble for some time. In No. 3 the trouble is recent and he has not yet learnt to fix with one and ignore the other confusing eye. This condition is found after crashes, influenza, fatigue, and debilitating diseases. Convergence power is estimated by giving the following values: 2 inches or under, very good, possibly excessive; 2 to 3 inches, good; 3 to 4 inches, fair; 4 inches and over, poor.

Cover Test for Muscular Defect.—Again ask the patient to fix a pencil held in a similar manner and with the other hand cover one eye with a card, move the pencil from side to side and then uncover; watch whether the eye moves on uncovering. Repeat the test for the other eye in a similar manner. A perfectly balanced pair of eyes will remain fixed on the pencil whether one is covered or not, whereas movement inwards or outwards on uncovering shows some lack of balance. If there is a convergent or divergent latency, it is described as slight, medium, or marked, and the response to the uncovering may be rapid, medium, slow, or no recovery. This to us signifies a good, bad, or indifferent reflex arc.

Red-Green Test at 20 feet.—The essential feature is that a suitable tint of red glass in one eye will cut out any rays of light from a green glass, and vice versa green glass in the other eye will cut out red rays. A slot 1/2 inch wide by 5 inches long is glazed in the upper 2½ inches with red glass and the lower 2½ inches with green. The person under examination—wearing a pair of reversible frames, glazed red in one eyepiece and green in the other—is told to look at the slot illuminated from behind and asked to state what he sees, and in event of both red and green being perceived what are their relative positions. A displacement of more than 0.5 of a degree of arc (about 2¼ inches at 20 feet) is not

considered good. An exophoric case may give at first an esophoric displacement owing to overcompensation, but as fatigue sets in the red image appears to swing through normal to the exophoric position. Hyperphoria or hypophoria combined with exophoria or esophoria exaggerates any liability to bad landings. Tendency to neglect one or other eye or each alternately is a marked and frequent feature in bad landers.

*Bishop Harman's Movable Diaphragm Test.**—This test has proved invaluable as a check on the others above mentioned. It has been found that a reading of 3 is a "border-line" one and that 5 is bad. First-class landers usually give a reading below zero; average landers, zero to 2; doubtful landers, 2 to 3; whilst those giving readings of 3 to 5 or more fall into the category of bad landers. Most of the individuals who landed badly had normal visual acuity and little if any error of refraction.

I wish to emphasize one point—namely, that I am considering the subject in terms of conditions "in the air," and I would ask readers to keep an open mind and not judge my remarks too critically by standards which operate "on the ground." I ask this for these reasons:

1. From birth upwards all our judgements of distance have been made with one known quantity—our contact with the ground. When, however, the aeroplane wheels leave the ground the pilot is in space, and this previously known quantity is immediately lost. What is more, before he can successfully land his machine he must make as correct an estimate as possible of the distance he is from the ground.

2. From the air all verticals are foreshortened and the known size of objects therefore varied from those which we have learnt as normal on the ground.

3. The action of centrifugal force on ocular muscle balance during turns, spins, loops, etc., has to be taken into consideration. If flying in a tight spiral looking in the direction of the aeroplane's course, or towards the centre of the "funnel" down which one may be travelling, no unpleasant effects will be felt; but if one looks outwards—that is, away from the centre rotation—the pain of having one's eyes apparently pulled out of the head is agonizing and a more comfortable position will be rapidly taken up. On coming out of a spin the horizon will appear to be going round in the reverse direction, and if the action has been excessive the pilot may be under the impression that he is not yet out of the spin, and make some further adjustment which results in his resuming spinning in the opposite direction with possible damage to himself or even fatal results. If a pilot has some tendency to imbalance then it would seem that rotation will be likely (by putting undue strain on the affected pair) to increase such tendency and to make his judgement faulty.

In conclusion I would like to make the following observations: The independent investigation of Group Captain Flack, made on Air Ministry instructions in the war, showed 80 per cent. of successes from eye training, and that by only treating suitable cases this percentage has improved since that time. Not only is greater proficiency in landing obtained, but also in game shooting and all fast ball games as the patients attest. The course only occupies a short time daily for three to five weeks.

The Air Ministry after careful investigation of results now sanctions the training of service officers who develop the defect, and bad visual judgement, even though visual acuity is up to standard, is now a definite cause of rejection for candidates. Lastly, instructors are sufficiently satisfied with the results to apply at once for an opinion where a pupil shows signs of inability to land.

GENERAL DISCUSSION.

Major-General Sir WILLIAM MACPHERSON, A.M.S., said that he responded with great diffidence to the President's invitation to take part in the discussion. The army had nothing like the scientific accuracy and ophthalmological researches of the flying services. In fact, the work of the flying services had given an entirely new aspect to the ophthalmological problems of the services. For a long time the tests in the army were by dots representing at a given distance the bull's-eye of a target at 600 yards. This was eventually replaced by the test types; but there was no differentiation between tests for visual acuity and errors of refraction. It was only the latter that was tested. But some years ago the Adjutant-General considered that artillery officers should have absolutely normal vision, and should not need to use glasses. Now this showed a wrong idea of ophthalmological conditions, because a myope with perfect visual acuity was really more valuable in long-range work of artillery than a man with a less degree of visual acuity but with little defects in refraction, because he was bound to use field glasses for his observations. During the war the fighting services were given spectacles. The chief difficulty with the infantry was that spectacles got dimmed by rain and mist, or got broken. One curious effect of the war was that spectacles had to be issued to the presbyopic.

Mr. RANSOM PICKARD (Exeter) said that during the months of February to April, 1915, he examined a number of men in a regular division in France. It became obvious in the first two months that those who had visual troubles were mostly those who had more than 1.5 of H; and that difficulty in seeing at night existed much more in these than in other men examined. In the next two months, with an equal number with refraction above 1.5 H, there were no complaints of night-blindness—when the nights were shorter. It was obvious that the difficulty at night was one of muscular strain in most cases. The practical issue was whether men having more than 1.5 H could, under present recruiting conditions, be excluded from the army.

Major E. B. SPAETH (U.S.A. Army) described some cases of plastic repair of the lids and the sockets by means of two methods, the first the presentation of the use of pedicle flaps for the simultaneous repair of both of the lids, and the fundus of the orbit also, should that be necessary; and the second a series of photographs showing ophthalmic correction of various defects and deformities according to the method of epithelial inlays of Gillies.

Mr. M. W. B. OLIVER (London) did not agree altogether with the methods of Major Spaeth, and especially criticized the forehead flaps. He discussed the question of glasses, and suggested that no man should be considered fit whose vision was not sufficiently good without, as glasses were frequently lost in action. He also discussed the question of night-blindness, and some methods of protection from missiles.

Mr. N. BISHOP HARMAN (London) said that the work that had been presented to the Section by Wing Commander Clements, R.A.F.M.S., was a most valuable contribution to their knowledge of the causes and effect of defective muscle balance. There were few conditions in civil life where such severe and sudden stresses occurred as those found in flying. But in the long continuance of ill health, especially those due to disorders of the alimentary tract, where there were at one and the same time defective nutrition and toxic absorption, there were to be found conditions which brought about ocular states very much akin to those set up by the more severe stresses. He illustrated this condition by cases of hyperphoria becoming troublesome for the first time in such states of ill health, and the immense comfort which could be secured for the patient by the discovery of these defects of muscle balance and their correction. Relief to these patients was the more important since their ill health often left them few relaxations beyond reading, and the ocular defect made reading difficult, even distressing.

Mr. E. E. MADDOX (Bournemouth) said that provided both eyes had good visual acuity, and the ocular balance and motor apparatus were good, the existence of a master eye was not incompatible with excellent orientation, and of this fact his old teacher, Dr. Argyll Robertson, was a good illustration, for although one eye was perfectly normal, and a complete master, while the other was astigmatic, he was as true an archer as to be included in the King's Body Guard for Scotland, and was esteemed by many to be the most beautiful operator in Britain. In the selection of candidates for aviation, Mr. Maddox suggested taking account of the nervous system as a whole, since defective ocular balance was so often accompanied by slight nerve defects elsewhere. In effecting a landing, coolness and self-collectedness were necessary to give the motor apparatus its proper training; there must be an absence of mental

* For description of this test see *Ophthalmological Society's Transactions*, vol. xxx, p. 56.

flutter. Special attention should therefore be given to improving the general health, and especially the nervous health of beginners. If ocular balance was upset by glare, might it not be that the motor reflexes were embarrassed by strong centripetal impulses, and might the same not be true of intestinal or stomachic irritation? The speaker once measured a distinct alteration in his oculo-motor relations during a temporary attack of colic, and indeed the temporary squint produced in children by worms might be classed in the same category. All this emphasized the importance of the general health. Another suggestion he offered was to supplement the tests in near vision already described by others on a scale more proportionate to the distances with which aviators had to do. Ought not, for example, version tests in distant vision to receive attention? Again, would it not be possible partially to reproduce the conditions required for landing, as, for example, to let a seated man down rapidly with a rope, and let him pull a handle at the appropriate moment? He could be let down perpendicularly, or, better still, swingwise. It would not be so easy to make an appearance of the earth to rise up towards a stationary man, but perhaps even that might be achieved optically, as by the beam of a searchlight moving very quickly at right angles to itself.

Major Carruthers (Liphook) had seen at Hampstead the result of Wing Commander Clements's training of cadets who had crashed and broken many machines, and was astounded at the results. Wing Commander Clements was not only an original worker who formed his own theories, but had the unique opportunity of putting his theories to actual test. However much his theories might be open to criticism, his results were facts and were beyond criticism. Major Carruthers hoped that Wing Commander Clements would remember that life is short, and would publish his methods and his results without long delay, as they would be of the greatest value to everybody interested in ophthalmology.

Major R. E. Wright, I.M.S. (Madras), asked Commander Clements whether the methods utilized by otologists in investigating nystagmus produced by rotation were of value in connexion with the examination of men in the air force. Such methods had been highly developed by ear specialists, and would appear to have a very direct bearing on experimental ophthalmology in the air force. With reference to the President's question as to glare and its effects in India, Major Wright knew nothing beyond what had already been published in works dealing with the subject. It was a very difficult thing indeed to put into concrete form the actual ophthalmological results of glare. Normal eyes in healthy individuals seemed to stand glare very well. There was undoubtedly such a thing as glare conjunctivitis, or sunburn of the conjunctiva.

Mr. J. A. Valentine (Southsea) said that the amount of convergence necessary during a landing when the plane was some ten to twenty yards from the ground was less than a fraction of a degree; in a case of orthophoria with convergence insufficiency there should be no difficulty in effecting this minute amount of convergence. The same applied to the amount of accommodation necessary in approaching the ground. Was it credible that even a large amount of convergence insufficiency could make any difference whatever to an otherwise orthophoric airman in effecting a landing?

The President congratulated the Section on the excellent discussion. Mr. Clements's work was an admirable example of how such research should be carried out. Whether one agreed with all his deductions or not was relatively immaterial, for a measure of criticism stimulated further research. His work also showed how any research revealed new problems which had to be investigated. He (the President) had had some experience of the visual problems which confronted all three services during the war. Investigations and experiments had to be carried out hurriedly and unsatisfactorily during the stress of war, and practical results—often of doubtful validity—had to be obtained and acted upon. These problems ought to be investigated during peace time, with the assistance of experts obtained if necessary outside the services. Funds had been made available for the air force, because the air force could not be efficiently maintained if such researches were neglected. Funds had also been found for industrial research, and allotted to the Industrial Fatigue Research Board. The problems which confronted the combatant services were of supreme importance, and he (the President) hoped that this discussion might stimulate the Government to provide the machinery and the means for solving them.

Openers' Replies.

Air Commodore D. Munro, in replying to the discussion, referred to the stimulating suggestions of Mr. Maddox, and said that whilst the services had contributed something to the discussion, speaking for himself, new aspects of eye problems had appealed to him since he came into the room, and he thought that the service members would take away a great deal to think about. Speaking for the air force, they were fortunate in that all these problems were submitted finally to the President of that Section himself, Sir John Parsons, who was a member of their Medical Advisory Board.

Wing Commander Clements, R.A.F.M.S., in reply said: The question of "master eye" was one having a great deal of bearing on a pilot's capacity to fly certain machines. It was usual to land looking out from the left side of the aeroplane. Further, some machines were notoriously "blind" right or left, and in the past enough attention had not been paid by designers as to whether a pilot's vision was restricted too much. With reference to "glare," Air Commodore Munro had said that the glare which affected landing ability was not acquired whilst in the air, but whilst on the ground prior to entering the aeroplane. Glare and the question of night-blindness might be taken together; all those suffering from glare, if not definitely night-blind, showed more or less signs of lengthened adaptation time to night conditions. Efficient convergence was considered important because it was thought that it was one of the essentials for appreciation of fine ocular muscle movements. It was his (the speaker's) argument that what was called fusion was in reality only the power of interpreting fine muscular movement in terms of depth; and that, binocular vision being acquired, true fusion was only attained by repeated trial and error in these fine muscular movements. It was an automatic act, the stages of which had been lost to consciousness but not to subconsciousness, and that if anything affected the final adjustment it would show up as an error of judgement in consciousness, and would then cease to be automatic. With regard to the toxicity cases mentioned by Sir J. Parsons and Mr. Bishop Harman, he was certain that there was undoubted evidence of their occurrence, and he himself had quoted influenza as a frequent cause of loss of convergence. Regarding the value of rotation tests and nystagmus times, labyrinthine sensations only gave information as to position in regard to the thing with which the person was in contact, but in an aeroplane during flight it was quite impossible for the labyrinth to give any information as to position in relation to the ground. As an example of this he quoted the well known effect of flying in clouds: a pilot had been known to emerge at the same point as he entered, but flying not only in the opposite direction, but also upside down, not realizing the fact until he was able to get a glimpse of the horizon. From this it would appear that vision was the final judgement in the recognition of position in space. In response to the request for information about training methods, Wing Commander Clements gave the salient features in relation to the various types requiring treatment.

Resolution.

At the close of the discussion the following motion was put to the meeting by the President:

> That this meeting of the Ophthalmological Section recommends that the Council of the British Medical Association press strongly upon the Government the great need for research upon

many unsolved problems of vision in relation to the requirements of the combatant services which have been brought before it. The meeting is convinced that efficiency and economy can only be obtained through the solution of these problems.

Mr. A. C. ROPER (Exeter), in supporting the resolution, said that some practical result should ensue from the important discussion on ophthalmology in the services, and that could be best attained by pressing upon the Government the importance and absolute necessity, in the interests of the public weal, of instituting research on these vital points.

The resolution was carried unanimously.

VISION IN NAVAL GUN-LAYERS.

BY

SURGEON COMMANDER W. K. D. BRETON, R.N.

THE efficiency of a gun-layer or range-taker must very largely depend on his degree of visual acuity, and it seems to me that in such highly specialized ratings existing convention is hardly stringent enough. When we say that an individual can read normal vision, or 6/6, we infer that he can recognize, as disparate, objects which subtend at the nodal point of the eye an angle of approximately 1 minute of arc. It has long been recognized that many can read 6/5 or even 6/4 and better, and in doing so define for themselves a visual angle that is very much smaller than convention demands. Hartridge and Owen in 1922 pointed out that with a single black line on a wide white field, where the conditions of simultaneous contrast are perhaps ideal, the width of the black line may subtend an angle of as small as 3.1 seconds of arc before visibility ceases. It is therefore very obvious, without going into further detail, that between existing convention and experimental result a wide hiatus exists. I have made a point of refracting, under a mydriatic, all men who failed to read 6/4 easily, and it has been my experience that in practically every case a small cylindrical error, often with a certain obliquity of axis, has been present.

During the last six or eight months I have examined 186 ratings, qualifying or requalifying for higher rating. Of these 114, or 61.3 per cent., read 6/4 in each eye, 11, or 6 per cent., read 6/5 in each eye, 9, or 5.3 per cent., read 6/6 in each eye, whilst the remainder showed varying degrees of defective vision. It must, of course, be emphasized that one is dealing with picked men in the third and fourth decades of life, and that, as executive ratings, they had all passed an initial test demanding 6/6 in each eye. To quote one example from our latest Admiralty Order on the subject, gun-layers may be passed for initial test if they can read 6/9 in each eye tested separately, and if any spherical or cylindrical error can be corrected by, at most, a 1 *plus* or *minus* spherical or cylindrical lens, or combination of these lenses. Requalifying tests, every two and a half years, are similar, but permit 6/12 in each eye. My problems then are: (1) The practical significance of small cylindrical errors which permit a man to read 6/6 or perhaps 6/5 partly, but no more. (2) Whether it is justifiable to assume that every healthy emmetrope should easily read 6/4. (3) Whether considerations along the lines I have indicated justify more stringent regulations in assessment. (4) Whether it is definitely proven or not that, apart from gross disease, as diabetes, there is evidence to show that an initially determined axial error may change from time to time.

Stereoscopy.—A wide controversy has for long existed as to the merits of the stereoscopic range-finder against the coincidence or monocular instrument; the latter, of course, depends for its efficient use entirely on monocular visual acuity. As far as I know a convention, as the visual angle, does not exist in estimating stereoscopic efficiency. Measurements are usually made and recorded in terms of parallactic change, and triangulation determined by taking the I.O.D. as the common base and the distant objects as the apices. Ability to judge distance, after eliminating all monocular potentials, is recorded in circular measure. Various figures have been recorded from time to time which show a mean stereoscopic accuracy of 8.2 seconds. In my own experiments during 1921 a mean accuracy of 4 seconds was frequently obtained. It must be observed, however, that such tests have been carried out under laboratory conditions, and there is no evidence to suggest how soon inefficiency and asthenopia from fatigue will supervene. My problems therefore are: (1) To find a convention that may be defined as normal stereoscopic vision. (2) To ascertain whether an initial high standard of stereoscopic efficiency will rapidly tend to wane either from fatigue or stress of circumstance.

Muscle Balance.—Present regulations disqualify where any imbalance exists exceeding 2 degrees prism, except in the case of stereoscopic range-takers where orthophoria is demanded. As far as inco-ordination in the vertical meridians is concerned, I am inclined to reject any candidate for higher rating, however small the imbalance. My problems are: (1) To what degree deviations in the horizontal meridian may be permitted in monocular work, as in coincidence range-finding, laying, etc. (2) The prognosis and treatment of moderate deviations in the horizontal meridian. A case recently came under my observation (a candidate for gun-laying—that is, monocular work) who read 6/4 in each eye, but had 9 degrees prism of exophoria. According to regulations he is unfit. Should this be so?

Colour Vision.—I have found few subjects more difficult to fathom than the various theories of colour vision. In any service we are naturally more concerned with practical tests than theory. I think I am right in assuming that the older tests—as Holmgren's wools, coloured beads, etc.—are obsolete and untrustworthy. I am at present using a series of test cards devised by Edridge-Green which appear to me an effective method of rapidly categorizing colour defectives or those showing a shortening at either end of the spectrum. My problems are: (1) Whether any other test of greater practical value exists. (2) Whether a tetrachromic (that is, an individual who can only distinguish four spectral colours—red, yellow, green, violet) may be considered normal for all practical purposes; in my series of 186 I had three dichromics who could apparently only distinguish the spectral ends red and violet.

NAVAL LIGHTING.

BY

SURGEON CAPTAIN R. J. E. HANSON, R.N.V.R.

THE senior service is keeping well abreast of recent work in ophthalmology, for no section of the community is more exposed to dazzle or more susceptible to the ill effect of faulty illumination in the confined spaces of modern naval craft.

A Naval Code of Lighting (see below) is now available for the guidance of those engaged in illumination. A discussion on the matter of this code would be helpful to the service and much appreciated.

Special attention has been given to certain inquiries from the hydrographic department of the Admiralty. In the tropics dazzle is a serious problem in boat work surveying. To eliminate this factor a pale green-tinted matte surface for drawing paper has been designed, this surface to be held, when possible, so that sunlight is not directly reflected into the observer's eyes.

The linear markings and notation on the survey staves have been revised, in conjunction with Captain Douglas, R.N., Assistant Hydrographer—so that the relative height and width of the foveal field is maintained when reading off lines and figures through glasses. Experimental work has been done at Whale Island, also in the submarine [illegible]ment, and at Kew Physical Institute, respecting visual postural fatigue in the use of periscopes and gun-sighting telescopes, etc. As the "orbital cone" of muscles effects the finer co-ordinate movements of the eyes, so the "spinal polygon" (small recti capitis muscles) are in co-ordination with the orbital cone, and effect, by their action, an increase in range of vision field without movement of the trunk.

To allow these two sets of muscles unharassed action (absence of fatigue and strain) it is necessary to give rest position to the large head-neck-trunk muscle groups. This has been achieved by use of an alternating head rest with

sponge rubber buffer to support the forehead and shield the eyes from extraneous stimuli. For gun-sighting telescopes the experimental firing with this device took place at sea in H.M.S. *Canterbury*, off Portsmouth, and I watched the successful issue of the trials with great interest.

NAVAL CODE OF LIGHTING.

Service Afloat.

1. In order to see well, several factors are concerned—fair health, good eyesight, normal retinal adaptation, sufficient light flux, adequate distribution and direction of light, and quiet contrast.

The Eye.—Vision is a complex affair, the eye being highly trained and delicately sensitive in retina and iris to the balanced reversible electro (chemical) reactions resulting from impact of light energy around the sensitive retinal terminals of the optic nerve. The eye is a trigger, as it were, that starts into action nervous impulses which arrive at the cortex of the brain where perception results, and whence highly complex co-ordinated actions originate. It is not the eyes only, but the whole mechanism of vision that is liable to fatigue under conditions of faulty illumination and mal-hygiene generally.

2. In any system of lighting, light will be reflected from surrounding objects, deck bulkheads, sides and impedimenta. Light so reflected will vary in quality and amount and such variation is important and is calculable in any system under the term "coefficient of utilization," usually 0.2 to 0.6 according to size, shape and tinting of enclosing surfaces.

3. The intensity of light, measured in lumen (1 lumen = 0.929 c.p. per square foot), to be maintained, should not vary appreciably from the following—with 25 per cent. margin for deterioration on instalment. [The table is omitted.]

4. Glare, glitter, and, on the other hand, gloom, are to be avoided. Source of light should be shaded, so that naked direct light subtends, at the eye, an angle of 75 degees or thereabouts (brow angle) with the visual horizon, when the eyes are directed straight forward.

5. Lamps should be mounted overhead in closer range (1 to 1) than in civilian practice, where the ratio of height of mounting above working plane to distance apart of the lamp is as 1 is to 1½.

6. *Dome Lighting.*—The principle of naval lighting is thus direct (ensuring economy) with total absence of dazzle (minimizing eye fatigue) and amounts in effect to a lowering of the "light ceiling"—the light issuing from a number of unobtrusive domes.

7. On the area of the working plane light should fall uniformly, and not vary over that area more than 4 to 1. Brightness contrast should not exceed the ratio of 20 to 1. For example, on a billiard cloth, beneath a shaded light source, the red and white balls receive the same uniform flux of light, but the whites reflect so much more light than the red ball, that annoyance is caused if total flux be excessive.

8. *Police Lights.*—[Details omitted.]

9. *Chart-room illumination* presents a threefold problem: (*a*) day lighting; (*b*) partial day and artificial lighting; (*c*) artificial lighting. In (*a*) a curtain or blind or green frosted glass housable shutter to be provided for sunglare. In (*b*) dome-shaded direct light from the upper left and rearward side of the navigator. This should be on a dimming resistance so that light flux may be reinforced when, in (*a*), flux of daylight is insufficient. In (*c*) as in (*b*) with added attention in providing an adequate coefficient of utilization.

10. *Submarines*—to be illuminated internally as in 1918 recommendations—care being taken that light flux be sufficient in amount and controlled by accessible switch, on rheostat. For use in harbour dome-shaded (75 degrees brow angle) lamps may be added. *Emergency lighting* by self-luminous radium bromide (foveal) spot lighting in vermilion-tinted fluting on levers, dial pointers, level surround and salient lines of control room (experimental research advised).

11. Reflecting surfaces should be free from glitter, of matte surface and champagne hue. Reflecting factor should be low from surfaces below and 30 degrees above the horizontal eye level—and high from surfaces above that angle.

12. Controlling levers and switches should be easily visible and naturally accessible.

13. In a bright light the eye is adapted or tuned to a high level of brightness and visualization remains good if variation in brightness be neither great nor rapid. Figures given in this code relating to artificial lighting must be X 2 for day-lighting at least, and partial day-lighting necessitates reinforcement by artificial.

14. A properly trained staff should be held responsible by the captain for cleanliness and condition of lamps, shades and reflectors.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

AN UNUSUAL CASE OF PNEUMOTHORAX.

THE following notes of an uncommon condition seem to be worthy of publication. The patient was a schoolboy aged 18 years, who received an injury to the chest while playing Rugby football.

The family history is as follows: Maternal grandfather lived to over 80 years and paternal grandfather died aged 86. He has no definite knowledge of his female grandparents. Father alive and well aged 75 years, mother 55 years and healthy. Two brothers alive—one aged 20 years healthy, the other aged 12 years described as delicate. One sister died at 2 years—cause unknown. There is no known history of pulmonary tuberculosis.

The patient had pneumonia in 1914, followed by whooping-cough, otherwise he has rarely been ill.

He was playing football on November 17th, 1922, and was in the act of scoring a try when an opponent knelt heavily on the back of his chest. He felt a very slight pain but no dyspnoea. The next morning he complained of slight pain in the left side of the chest over the precordium. There was no evidence of fractured rib. In two days he felt perfectly well. He played football again on November 24th and, after the game, complained of slight shortness of breath.

I found the following physical signs in the chest: There was no alteration in the percussion note over either lung, nor any change in vocal fremitus or resonance. Over the right lower lobe posteriorly there was an area of high-pitched distant bronchial breathing. I sent him to Dr. A. J. Cleveland of Norwich for an opinion, especially having in view the *x*-ray findings. The following are his notes of the case:

"I saw this patient on November 28th, 1922. I found that both lungs were resonant all over. The heart apex was just outside the nipple line. Over the right lower lobe there was a fair-sized patch of bronchial breathing. I got a modified 'bell sound' but no metallic tinkling. With *x* rays it was obvious that there was a moderate-sized pneumothorax at the outer and lower side of the right pleural cavity. I could find nothing to suggest a fractured rib. In 1914 he had a bad attack of right lobar pneumonia and whooping-cough, and I conclude this must have left some weakness of the alveolar walls, which gave way under the strain caused by a heavy man falling on his chest. I saw him again a fortnight later and the physical signs were much less definite and, after another fortnight, I could not detect any evidence of pneumothorax either with *x* rays or the stethoscope. At no time could I find any evidence of pulmonary tuberculosis. When I last saw him he appeared to be in excellent health."

He returned to school on January 20th, 1923 (he had been resting quietly at home till then). He began to play hockey about a fortnight later and played regularly until the end of March. I examined his chest several times and could not detect the slightest abnormality.

A. S. HENDRIE, M.B., Ch.B.Edin.,
Medical Officer, Gresham's School.

TWO CASES OF LIGHTNING STROKE.

THESE two cases are considered worthy of record as I have not seen a similar train of symptoms recorded elsewhere.

Both men were standing in the door of a cowshed while a violent thunderstorm was in progress. A flash of lightning struck them, throwing both to the ground, one on top of the other. They were seen about half an hour later. Both had arborescent markings on the left side of the face and neck of an erythematous nature. The marks lasted for about twenty-four hours.

One was rendered unconscious by striking his head on the brick floor. As a result of the fall this man developed a traumatic cataract. From the time of the injury he complained of blindness in the affected eye and there was considerable conjunctival suffusion. Opacity of the lens was not obvious until about the tenth day; it then gradually increased, and the eye has been operated on.

Both men complained of pain in the supraclavicular region radiating down the arm. Weakness of the affected limb and sensations of pins and needles were present for two or three weeks, but this condition cleared up, leaving no disability.

Burgess Hill, Sussex. I. H. LLOYD-WILLIAMS, M.B., B.S.

Reports of Societies.

INSULIN IN GENERAL PRACTICE.

At the meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine held on October 9th, Sir William Hale-White presiding, a discussion took place on the use of insulin in general practice.

Professor Hugh Maclean, in opening, said that personally he had seen nearly a hundred diabetic patients who had been treated with insulin, and in every case the result was beneficial, often it was dramatic. He believed that insulin might be quite safely used by the average general practitioner, though stringent precautions must be taken and certain contingencies guarded against. The most important of these precautions was to go ahead very gradually. Short cuts must not be tried in general practice. Insulin when given carelessly might result in the death of the patient. The symptoms produced by an overdose of insulin varied considerably. Generally they consisted of flushing of the face, with sweating, often followed by some degree of pallor; often also there was a sense of constriction about the throat and chest, and giddiness and physical weakness might be present. The occurrence of these and other clinical phenomena was associated with the action of insulin in lowering the blood sugar concentration. When insulin symptoms were in evidence they were more severe the lower the blood sugar. But even though the symptoms of the hypoglycaemic complex might be very severe, fortunately they responded easily to treatment. The giving of sugar by the mouth would quickly remove the condition, so that there was little or no danger if the patient was carefully warned to take some sugar whenever any symptoms appeared. It was a good plan to keep a glucose solution (50 per cent. strength) ready to hand, and to instruct the patient to take from 1 to 2 oz. of this on the occurrence of symptoms. The effect of insulin on the diabetic condition was to restore the patient to the condition of the normal individual, though it was now generally accepted that insulin did not cure diabetes; while it was being administered the symptoms disappeared and the patient regained health and strength, but on stopping the insulin the symptoms returned. The general practitioner, to begin with, must make certain that he was not attempting to treat an unsuitable case. In general it was most important to be sure that the case was really one of diabetes or very marked glycosuria with high blood sugar content before giving insulin. In most cases the ravages of the diabetic condition were sufficiently obvious, but there were cases, often in elderly individuals, in which the examination of the urine showed a large amount of sugar, but no ketone bodies or only traces of them, and in which the patient was not emaciated, and might appear in quite good condition. In these cases a careful régime should first be ordered, and only if this was not successful in removing the glycosuria and materially reducing the blood sugar should insulin be employed. If a patient's urine did not give an acetone reaction great care must be exercised, and the possibility of "renal glycosuria," which it would be dangerous to treat with insulin, must be kept in mind. Occasionally one saw a patient in whom the diabetic condition appeared to be very severe, but whose response to diet was extraordinarily good; here insulin was not indicated. In a case suitable for insulin, the diet should first be arranged and the patient given the necessary amount of insulin to keep his blood sugar within normal limits. It was better to give a patient a moderately good diet with the maximum amount of insulin, even when such diet produced glycosuria, rather than to keep him on starvation diet, with which the glycosuria might be much diminished or even absent. The dieting and the dose of insulin should be carefully correlated. The patient should be placed on a fixed diet sufficient for his wants, and then increasing doses of insulin should be given until satisfactory results were obtained. The daily dietetic allowance should contain from 10 to 15 calories for every pound of the patient's weight. The protein allowance should be in the neighbourhood of half a gram or less per pound weight, while the carbohydrate should be small, and the fat content comparatively high. Having arranged a definite diet, the patient should be kept in bed, or at all events indoors, for a few days at the beginning of treatment. His urine should be collected and examined each day for sugar and ketone bodies. The daily injections of insulin, beginning with 5 units in the morning and 5 in the evening, should be slowly increased until the urine became free from sugar, or until the dose given was one beyond which the medical man did not feel inclined to go. It was safer not to give more than 50 units a day as a maximum. The best time to give insulin was thirty minutes before the morning and the evening meals. If on reaching the extreme dose—which in a table he showed was 30 units twice daily—the glycosuria still persisted, it was well to continue for a little time with this dose, and to cut down gradually the carbohydrates of the diet. The majority of his own patients remained in good health and without glycosuria on a dose of from 10 to 25 units of insulin twice a day. The important point was not to hurry too much at the beginning of treatment, but to give progressively increasing doses over a fairly long period. In diabetic coma large doses should be given. The treatment might begin with an injection of 20-25 units, followed by a similar amount in two hours or less if no definite improvement took place. Sugar ought not to be given in these cases along with insulin; in certain cases it did no harm, but in some it seemed to neutralize the insulin. Generally in diabetic coma insulin acted in a dramatic manner, but its effect could not be forecasted with certainty.

Dr. George Graham said that although insulin was of great value in diabetes it could not be regarded as a substitute for the ordinary dietetic treatment. Cases must still be dieted, though possibly not so strictly. The Toronto school, and also Allen and his co-workers, believed that insulin should be so used that the blood sugar curve became normal, and with this view the speaker was in agreement. Other workers both in America and this country seemed to think that the clinical appearance was of first importance; others held an intermediate view, that the urine should be sugar-free, but that it did not matter so much if the blood sugar was slightly raised. He gave an account of 23 severe cases treated at St. Bartholomew's, of which 19 returned to the normal blood sugar curve with insulin. From a study of the exceptions it seemed that there were some cases in which the normal blood sugar could never be reached. The insulin dose, which to begin with was one dose of 10 units a day, was gradually increased, but large doses should only be given while the patient was in hospital or nursing home under intelligent supervision. He had never sent patients out of an institution while they were taking more than 20 units in the morning and 20 at night. It was comparatively simple to bring down the blood sugar to normal if one waited long enough and gave big enough doses; the difficulty was to know what to do afterwards. At present he was aiming at gradually decreasing the dose of insulin as the patient improved until only one dose of 10 or 15 units a day was given; then he increased the protein and the fat of the diet, and delayed the addition of bread for as long as possible. While the result of the treatment of advanced cases of diabetes with insulin was quickly known, the result of the treatment of early cases could not be stated until some years had elapsed. To six patients who had had fairly recent attacks he was giving small doses of insulin, and was holding his hand with regard to carbohydrates; the result was yet to be seen.

Professor J. J. R. Macleod (Toronto) confessed to being somewhat at a loss in talking on the subject from the clinical side. The previous speaker had touched upon the possible value of small quantities of insulin. It was the experience of most of those who had used this method of treatment that, although it might not be possible with very small quantities to bring about any great change in the objective symptoms of the disease, it often resulted that the patient felt very much better in himself as a result of these administrations. He and his colleagues had lately been carrying out an experiment which bore upon this

point. The experiment was designed for the purpose of measuring the glucose-equivalent of insulin—that is, the amount of glucose that each unit of insulin could cause to be metabolized. His clinical associates had tried very carefully to determine in what they called "pedigree" patients—patients with a definite diabetic history, carefully controlled, and dependable for observations—how many grams of carbohydrate one unit of insulin was capable of causing to be metabolized in the diabetic organism. They found that the glucose equivalent varied considerably; one unit of insulin would sometimes give a glucose equivalent of nearly 2½ grams, and under another set of conditions one as low as 0.75 gram. It interested them to find out the reason for this variability, and they started with the assumption that the clinician was faced with a necessary error in that he had to use a patient who was not completely "depancreatized," and whose glucose equivalent, therefore, could not be expected to be always the same. The experiment accordingly was carried out on "depancreatized" dogs, and the results were remarkably constant in different animals; when 20 units of insulin were given per day the glucose equivalent was about 5.8; when 40 units were given it was about 3.0. When the animal was excreting considerable quantities of sugar, the unit of insulin had a much greater effect than it had when the animal was almost sugar-free. One could imagine that when insulin was given in small quantities, all of it was used in the organism, and came into contact with the glucose molecules which it caused to be metabolized. It seemed to the speaker that it would be of value to the patient to be treated with very small quantities of insulin, and investigations were now proceeding on the introduction of these in some special way. Such quantities would gradually increase the patient's ability to metabolize carbohydrates, and might make just the necessary difference to bring about a tolerably healthy state in those persons who were suffering from the milder forms of the disease. A good deal had been said about the skin irritation which sometimes followed administrations of insulin. So far as he could discover, this depended on the fact that insulin preparations always contained the trace of a protein. Insulin was prepared sometimes from the pancreas of the ox and sometimes from that of the pig. When a patient showed irritation after the administration of one kind of insulin, he frequently showed no such irritation on changing over to the other kind. From the discussion there appeared to be a difference of opinion as to whether patients should be given a sufficient amount of insulin to keep them normal in respect of blood sugar, or should be allowed to carry a certain load of glycosuria constantly. He thought that at the outset of treatment with a substance like insulin it would be safer to proceed on the basis that the blood sugar should be kept at the normal level. There was not sufficient evidence to justify the assumption that an excess of blood sugar might be regarded as a physiological condition. Another point was that in a case of diabetes going on for some time in which there was marked diuresis as well as glycosuria, treatment with insulin removed the glycosuria, but in a great many cases not the diuresis. It was well to remember also that adrenaline might not act in removing the symptoms of hypoglycaemia unless there was a store of glycogen in the liver; it was well to be prepared to give an intravenous injection of glucose in cases in which adrenaline might not act. Lastly, Professor Macleod described the arrangements in Toronto, made through the Ontario Medical Association, for giving a two-day course of instruction to general practitioners, at the rate of forty a week, the instruction taking the form of lectures and clinical demonstrations on dieting and insulin. As a result of these measures, no serious accidents had occurred in Canada from the use of insulin by the profession at large. The provincial Government through the Health Board had placed at the disposal of those doctors who had taken the recognized course free supplies of insulin for their poor patients.

Dr. E. P. Poulton agreed with the views of Dr. Graham and Professor Macleod that the governing aim should be to get the blood sugar within normal limits. He believed that in the majority of cases it was possible to treat the patient efficiently in general practice, without doing blood sugar determinations, provided the process was carried out slowly and the practitioner had had some experience of the treatment. He had not yet come across a case of glycosuria with a high blood sugar which had not been benefited by insulin treatment, and it was remarkable that the feeling of tiredness and general ill health disappeared even in patients in whom the diabetic condition might almost be regarded as secondary. In the treatment of diabetic coma one started with fairly large doses; he usually gave 40 units, which was repeated in four or six hours, and every specimen of the urine was tested for blood sugar. In one of these cases the patient, after being brought round to some extent, ultimately died; on testing the urea in the blood in this case it was found to be considerably above normal, although to the naked eye—a pathological examination had not yet been made—the kidneys appeared to be perfectly normal.

DIABETES AND INSULIN.

Sir William Willcox, who was inducted to the chair of the West London Medico-Chirurgical Society on October 5th, delivered his presidential address the same evening before a large gathering at the West London Hospital. He said that recent discoveries in the treatment and etiology of diabetes had been one of the romances of medicine. Seldom, if ever, had such a rapid succession of epoch-making researches on one disease been forthcoming in so short a period. Diabetes was a disease which had been recognized for centuries. Willis, in the seventeenth century, gave an accurate description of it, and Dobson, in the eighteenth, actually demonstrated the presence of sugar in the urine; but it could not be said that the knowledge of its treatment had appreciably advanced until within the last decade, when the modern dietetic treatment with its principle of pancreatic rest was introduced. Formerly the diabetic patient, owing to the hyperglycaemia and acidosis usually present, was always on the brink of disaster. Any disturbing circumstance, such as an added infection or a physical or mental shock, might be sufficient to raise the toxic effect of the hyperglycaemia and acidosis beyond the point of tolerance and cause the development of a fatal coma.

The discovery of insulin meant a great further development in treatment. The administration of insulin to a diabetic patient brought about rapidly an effect which otherwise could only be attained after several days of careful dietetic treatment and fasting. Insulin raised considerably the carbohydrate tolerance of the diabetic and enabled him to take with impunity a dietary the calorie value of which approached normal. The ultimate isolation of insulin by Banting and his co-workers was an excellent illustration of the value of careful and accurate scientific research, and he thought that in this country also we had reason to be proud of the staff work and organization whereby an admirable preparation of insulin was made widely available. In France, on the contrary, he was told on a recent visit that there had been the greatest difficulty in obtaining insulin for patients, and also in obtaining preparations which did not give rise to abscess-formation.

Coming to the selection of cases for treatment, Sir William Willcox said that the presence of glycosuria in any patient was a serious symptom and called for careful clinical examination. It was important to determine the blood sugar curve. For this purpose, first thing in the morning, before any food was taken, and after the bladder had been emptied, 30 grams of glucose dissolved in 150 c.cm. of water were given; samples of blood were taken immediately before the administration of the glucose, and every half-hour for three hours afterwards, and the nature of the curve usually showed at once whether the case was one of diabetes mellitus. He exhibited comparative curves. In the normal subject the curve would begin at about 0.10, rise to some figure below 0.18, and fall in one and a half to two hours to something below the starting level. Even in apparently mild cases it was advisable to determine the blood sugar curve, because this furnished information of the greatest value in arriving at any decision as to the right line of treatment. A marked alteration in the blood sugar curve in certain cases followed the effect even of slight dietetic modification. A mild type

of diabetes, to which the name "renal glycosuria" had been given, did not present the usual clinical symptoms of diabetes, and the blood sugar curve at once differentiated cases of this class from those of true diabetes. The occurrence of glycosuria here was due to a low kidney threshold. In such cases insulin treatment would be very dangerous. All that was necessary was the restriction of carbohydrates within moderate limits and the avoidance of sugar in the dietary. Cases of glycosuria also were not infrequently met with in which the cause might be dietetic indiscretions, nervous shock, or some constitutional disturbance such as an acute toxaemia from a septic focus. In such cases rest and appropriate dietetic and other treatment might lead to rapid disappearance of the glycosuria.

The plan of treatment to be adopted depended upon the persistence of the glycosuria and the character of the blood sugar curve. Clinical observation was of first importance. In certain cases, as in elderly or tuberculous people, a too strict adherence to a rigid dietetic treatment might do more harm than good. Each case must be treated on its merits. When a diabetic condition was established it was essential, unless there were special contraindications, that a definite course of treatment be carried out. One of the most important considerations in the treatment of diabetes was the possibility of infection. It was well known that severe glycosuria might result from the toxaemia of acute infections, and clear up when the septic focus was removed. His experience at St. Mary's had been that the removal of any focal sepsis in diabetic cases improved the tolerance in every case, and in some cases of diabetes of several months' standing raised the tolerance practically to normal. If a toxic focus was present in diabetes, insulin was not going to do any good, for the effect of the septic focus was to neutralize the insulin. This fact, he thought, explained insulin failures. A septic focus must be sought for very carefully. The ordinary examination of the teeth was not sufficient; they should be examined radiologically. Similarly the most careful examination should be made of the tonsils. The removal of the septic focus was not attended by danger, provided proper precautions were taken. In the severe cases of diabetes, with a low tolerance and hyperglycaemia, insulin was invaluable. It was also of great value in cases where acid intoxication was present. But the haphazard administration of insulin in diabetic cases was not likely to lead to any permanent benefit, and, moreover, was fraught with danger. Only along methodical lines were good results to be expected. If an ordinary dose of insulin was given to a person with a normal blood-sugar curve it had no toxic effect, owing to the neutralizing action of the blood sugar, and therefore some might assume that it would be feasible and advantageous to give a patient with a high blood sugar curve three or four times the normal dose. This, however, was not the case at all, for the simple reason that these diabetic patients had no sugar reserve. Another precaution which he mentioned was the undesirability of giving insulin after midday. A 10-unit early morning dose might be given, perhaps increased to 15 or 20 units, and in a severe case a third of the early morning dose might be given at midday, but not later.

In conclusion, he said that there was no question that insulin in severe cases had markedly beneficial effects. It was of the utmost value where acidosis was present and coma was threatened. In cases where acidosis was present it was well to give fairly large doses of insulin, and with the insulin to give glucose by the mouth, and a fairly liberal allowance of sugar. Up to the time of the discovery of insulin diabetic coma was incurable, but now there were quite a number of cases reported of complete recovery after diabetic coma had developed. The cases which failed were cases in which the coma arose when something more than the pure diabetic condition was present.

NEWCASTLE AND NORTHERN COUNTIES MEDICAL SOCIETY.

The first meeting of the new session of the Newcastle-upon-Tyne and Northern Counties Medical Society was held in the Royal Victoria Infirmary on October 4th. The President, Dr. R. ESMOND MOYES, was in the chair, and about one hundred members were present. A large number of medical and surgical cases were demonstrated by the following members: Professor W. E. Hume, Drs. George Hall, G. A. Berkeley-Cole, S. Whately Davidson, J. C. Spence, Professor H. Brunton Angus, Messrs. Hamilton Drummond, W. A. Hewitson, H. Harvey Evers. A series of pathological specimens from the museum of the University of Durham College of Medicine was arranged by Mr. W. E. M. Wardill, the Curator.

The Society meets monthly during the winter session, and in addition to the ordinary meetings two clinical and pathological meetings have been arranged for the convenience of country members, at 4.30 p.m. on October 24th, and January 23rd, 1924. The annual address and dinner will take place on December 6th. On February 7th, 1924, an address will be delivered by Dr. Hugh Thursfield, London, and on March 6th a discussion will be opened by Dr. Leith Murray, Liverpool, on "Caesarean section, its history, indications, and limitations."

CELTIC MAN ON THE SUSSEX DOWNS.

A SPECIAL meeting of the Brighton and Sussex Medico-Chirurgical Society was held on September 22nd, 1923, when the President, Dr. ELIOT CURWEN, F.S.A., departing from the usual custom, invited the Society to Park Brow, a hill in the parish of Sompting, and there delivered his presidential address on "Celtic man on the Sussex Downs." Beginning with a survey of the geological and climatic conditions of Sussex in prehistoric times, he proceeded to show that the chalk areas in the south-east of Britain supported the most settled and civilized inhabitants of the country during the five or six centuries which preceded the Roman conquest. He spoke of the great quantities of corn which were grown in the south-east parts of Britain from the time of Pytheas (323 B.C.) till the end of the Roman occupation, and then proceeded to demonstrate on the ground the evidence still remaining that Park Brow was inhabited from the beginning of the Early Iron Age (about 550 B.C.) to the fifth century A.D. He pointed out the "lynchets," or cultivation-balks, of the Celtic fields, and explained their characteristics and the manner in which they were formed; he also demonstrated what he stated to be one of the longest and most interesting stretches of Celtic road in Sussex. The members then walked down this road to the circus, or moot, of the Celtic community, and when they were seated on its low, broad banks, the president explained its origin and character and the purposes to which it was put. Attention was next drawn to the site of the town, or village, at the entrance of which the circus was situated, and the character of the dwellings was described. A storage pit for grain, 6 ft. deep and 8 ft. in diameter, was then shown, and it was pointed out that the pottery found therein belonged to the Hallstatt and earliest La Tène periods, about 500 to 400 B.C. Evidence was adduced to prove that the early inhabitants on Park Brow spun their own wool or linen, and wove it into fabric; and after a brief description of the ground culture attained, as shown by Early Iron Age finds elsewhere, an endeavour was made to obtain an insight into the mind of the late Celtic inhabitants of the land by the evidence offered (if they might be taken as genuine) by the Triads of Moelmud.

AT the annual meeting of the Association of Certificated Blind Masseurs Sir Robert Jones, the president, referred to the progress made by the association during the past year. At the end of this, the fourth, year of its activities, its members numbered 160, 81 of whom were blinded soldier masseurs, 37 civilian masseurs, and 42 masseuses. The thanks of the association were due to St. Dunstan's Hostel for Blinded Soldiers and Sailors, which had made a grant of £448, and the National Institute for the Blind, which had made a grant of £224, to further the work of the association. The income for the year was £848, and there was a balance in hand of £64. Sir Robert Jones pointed out that the association was not of the nature of a transient war charity, as 79 of the 160 members were civilians. He insisted that the notion that a blind masseur could not equal the skill of a masseur with sight had no foundation in fact; the blind were, indeed, specially suited to become masseurs, and they acquired in certain directions a deftness and delicacy of touch not often met with in an ordinary masseur.

Reviews.

KLAATSCH'S THEORIES OF EVOLUTION.

TOWARDS the end of last century, when Professor Gustav Schwalbe of Strasbourg was demonstrating that Neanderthal man represented a distinct species of humanity, he was joined in his investigations by a young anatomist from Breslau who forced himself on the attention of the anatomical world by the dogmatic, almost overbearing, way with which he expressed his opinions. His name was HERMANN KLAATSCH. He was born in 1863, and had been a pupil of Gegenbauer's, and assistant to Waldeyer, but the man he modelled himself on was Ernest Haeckel. Like Haeckel, he was capable of doing good work and also of giving an air of finality to the most rash kind of supposition. Like Haeckel, Klaatsch made the problems relating to man's origin the chief interest of his life, and, as was the case with his prototype, was careless whether or not he took his colleagues with him so long as he could gain the large ear of the public. Klaatsch, indeed, carried into his professional work the bearing and methods of a robust pugilist, and the frontispiece of this posthumous book of his, *The Evolution and Progress of Mankind*,[1] shows that his physique was in keeping with his professional methods.

This robust German professor had an immense power of work. Having made his preliminary comparison of the fossil remains of the Neanderthal and modern types of man—of which he published voluminous reports—we find him in Belgium and England studying the kinds of stone implements which ancient men of those countries made and used. Then he hurried off to Australia and neighbouring lands to study living men of the most primitive existing type, for he rightly perceived that in no other way could a living picture be formed of man's life in Europe during remote times. Then in 1906 he was back again in Europe to fill the chair of anatomy in Breslau, and in time to see the famous Heidelberg mandible unearthed and to help his Swiss friend Hauser to uncover very important finds of fossil man in France.

It will thus be seen that Klaatsch was eminently qualified, so far as actual experience is concerned, to write a treatise on the evolution of man. His death in 1916, at the age of 53, robbed anatomy of one of its most interesting figures. His treatise on man's evolution—written purely for a lay audience—had to be completed by his friend, Professor Heilborn. It is this treatise which has been translated by Mr. Joseph McCabe and now published in England.

Many of the doctrines which are here preached with such a show of assurance rest on a most slender basis of fact and can do no ultimate good except in so far as they provoke those who know to undertake the thankless task of demonstrating them to be erroneous. When examining the bones of Neanderthal man Klaatsch was impressed, and rightly so, by the number of points in which they resembled the corresponding bones of the gorilla. He believed he could recognize a similar combination of characters in the skeletons of robust kinds of West African negroes. To account for these common characters he supposed that the gorilla, Neanderthal man, and the African negro were branches of a single ancestral phylum. Without an iota of geological support he supposed that this ancestral phylum was represented—not by an anthropoid stock—but by a man-ape kind of being and that the gorilla was a degenerate representative of this humanoid ancestral stock. He recognized a resemblance—a very superficial one—between the orang and the Mongolian races of Asia. To account for this resemblance he supposed that the orang, the Mongol, the Australian aborigine—whom he almost deified—as well as the European, represented another phylum which arose from his purely hypothetical ancestral stock of man-apes. Anyone familiar with the intimate structural similarity which exists between all the races of mankind and the structural differences which separate man and anthropoids, to say nothing of the structural agreement which links anthropoid to anthropoid, will at once realize the almost childish impossibility of Klaatsch's theory of a separate phylum for the orang and Mongol on the one hand, and another for the gorilla and negro on the other. Time after time his guesses have been riddled by facts and argument.

But fact and argument fell from Klaatsch as water from a duck's back. In this volume all the old unsupported statements are reproduced as if they were undeniable gospel. He again reiterates the belief that man has retained, in the form of his teeth and shape of his palate, parts of a primitive heritage, borrowed from the lowest of primates, whereas the evidence of embryology and of fossil man leaves no doubt that the human teeth and palate are reductions from a true anthropoid form. We find him supporting the prevalent misconception that all the characters shown by a human foetus are ancestral and primitive, the truth being that in the majority of instances such characters are recent and new. He even cites the long period during which the human child is dependent on the mother as embryonic and ancestral at bottom. Klaatsch's theory is a relapse to the wild doctrine of Lord Monboddo, who regarded apes as degenerate kinds of humanity.

In spite of the many false doctrines promulgated in this book there is much also to be praised. Klaatsch may have been eccentric in his support of evolution, but he was never half-hearted. He had the most unbounded belief in Darwin, in Huxley, and in the Australian aborigine as well as in himself. He had no fear of any problem; he broached the origin of man, his religion, his clothes, his home, his marriage, his morals—all that is man and of man. He may raise in his expert reader a powerful sense of opposition but he never permits him to go to sleep.

The translation reads easily, but there are certain points in which an expert anatomist could have given the translator some help. The femur of the poor man of Java should not have been printed upside down; the turbinate processes of the nose should not have been called "muscles," nor is it right to speak of the external ear as a "muscular shell"; nor should the cortex of the brain have been labelled as motor, *sensitive*, and sensory; nor the anterior belly of the digastric muscle described as a "double-bellied chin"; nor the ventricular pouches described as coming off under the vocal cords; nor the upper end of the precentral convolution be described as "lying nearest to the skull"; nor the skull of the Combe Capelle man as being 200 cm. long—that is, ten times too much.

The type is large and clear, the illustrations well printed, but the book, if light to read, is terribly heavy to hold in one's hands.

[1] *The Evolution and Progress of Mankind.* By Professor Hermann Klaatsch, M.D. Edited and enlarged by Professor A. Heilborn, M.D. Translated by Joseph McCabe. London: T. Fisher Unwin, Ltd. 1923. (Roy. 8vo, pp. 316; 111 figures. 25s. net.)

DISEASES OF THE NERVOUS SYSTEM.

To produce in one volume a complete textbook of neurology and psychiatry and to keep it up to date is an ambitious task. Drs. JELLIFFE and WHITE may fairly be congratulated on the result of their labours, which appears as a handsome volume replete with figures and diagrams.[2] Their confessed aim has been to treat the nervous system and its diseases as a whole and thereby to bridge the gulf between nervous and mental diseases which exists in so many textbooks. In this book may be found a wealth of information fully illustrated by photographs and diagrams and admirably supplemented by reference to the literature incorporated in footnotes.

The general arrangement of the work and the classification of the material is good, though on a closer examination certain disadvantages appear. Thus the chapters on methods of examination are perhaps unnecessarily long and contain matter which would be more appropriately placed under the diseases of different parts of the nervous system. In some respects there has been an unequal treatment of material. Thus, for example, while eighteen pages

[2] *Diseases of the Nervous System: A Textbook of Neurology and Psychiatry.* By Smith Ely Jelliffe, M.D., Ph.D, and William A. White, M.D. Fourth edition. London: H. K. Lewis and Co., Ltd. 1923. (Roy. 8vo, pp. 1119; 475 figures, 13 plates. £2 2s. net.)

are devoted to a very full and detailed description of migraine, only two pages are allotted to myasthenia gravis. The account of the symptomatology of cerebral tumours is disappointing and there is no mention at all of tumours of the third ventricle.

Vascular lesions of the brain are dismissed much too shortly, and we consider that the authors go too far in their avoidance of any clear differentiation between haemorrhage, embolism, and thrombosis. The student in search of an account of the sensory disturbances in cerebral lesions must look for them in the chapter on cerebral apoplexies; this surely is a defect in arrangement.

The various forms of syphilis of the nervous system are described together in one chapter, for which we have nothing but praise. Here the important question of treatment is fully discussed. The general symptomatology of the lesions of the brain stem and cerebellum are well described, with the aid of numerous diagrams, many from Dejerine's classical textbook. Anatomical and physiological considerations throughout receive careful attention and this is a valuable feature of the book.

Undoubtedly the most debatable aspect of the whole book is its treatment of the neuroses in general and of their etiology in particular. The authors are whole-hearted followers of Freud and present their case accordingly. Had other views been allowed more consideration this section would have had greater value.

The section entitled the endocrinopathies contains many hypotheses which are presented as though they were facts, a criticism which applies also but with less force to the section on vegetative neurology. The chapters on mental diseases are short and concise; they succeed in conveying a satisfactory account of the symptoms and nature of the more common psychoses.

The illustrations are very numerous, and in most cases good, though suffering in some instances from too much complexity.

The fastidious English reader will probably find many expressions to which he may object, and some sentences the exact meaning of which he may legitimately be excused from appreciating. In a short review it is difficult to draw attention to all the points which invite criticism; while cordially welcoming this edition we have thought it right to emphasize some aspects of the book in which we think it falls short of being an ideal textbook for students. Of great value to the senior and experienced student, it is perhaps too unwieldy for the capabilities of the junior, as well as too one-sided in some of its views; yet, without doubt, it is a monument of industry and, read with discrimination, a very valuable addition to the library.

URGENT SURGERY.

The English translation of Professor Lejars's well known book, published with the title *Urgent Surgery*, was carried out so well by Mr. W. S. Dickie and Mr. Ernest Ward, that it has now reached its third edition.[3] It has been prepared to accord with the eighth French edition. All the chapters have been revised, and have undergone some modifications, embodying the lessons of war surgery. Thus the work of Fiolle and Delmas is used in the description of ligature of the vessels, and most of the surgery of accidents bears the imprint of our more recent acquisitions of knowledge. Professor Lejars is, however, an excellent and discriminating author, who knows well what to choose and what to leave out. He gives as a rule no more than one method of treatment, and does not obfuscate the issue with a mass of alternatives and irrelevancies. We doubt the wisdom of the advice given on page 782, to curette the medulla in acute osteomyelitis. A sufficient removal of bone cortex allowing of free medullary drainage is equally efficacious, is more in accord with general surgical principles, and less likely to lead to death of the bone with subsequent sequestrum formation. The section on whitlows might well be revised in future editions. The book, we have no doubt, will continue to make a wide appeal. It is ideal for the occasional operator, for the practitioner who may be called upon suddenly in some emergency to relieve, say, an acute abdominal condition. Such are happy to have so wise a mentor and one who so clearly expresses his meaning. In this respect no little credit is due to Mr. Dickie and Mr. Ward, who have made a model translation, neither distorting the author's meaning nor substituting their own personalities for his. The production of the book is well worthy of Messrs. Wright and Sons' high reputation, and the thousand illustrations are in every way admirable.

[3] *Urgent Surgery.* By Félix Lejars. Third English edition. Translated from the eighth French edition by William S. Dickie, F.R.C.S., and Ernest Ward, M.A., M.D., F.R.C.S. Bristol: John Wright and Sons, Ltd.; London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd. 1923. (Sup. roy. 8vo, pp. xiv + 808; 20 plates, 1086 figures. 63s. net.)

PHARMACOLOGY AND THERAPEUTICS.

The *Text-book of Therapeutics*, including the essentials of pharmacology and materia medica, by Dr. A. A. Stevens, is a well established and standard textbook, for it was first published in 1895. The fifth edition appeared in 1916, and the new (sixth) edition[4] has been practically rewritten and descriptions of twenty-five new drugs introduced. The author states that the object of his book is "to present a concise description of the most important pharmacological reactions and to show their practical use in influencing the various disturbances that occur in disease." It is a large book (793 pages), and as the title indicates it covers a wide range, for it is practically an attempt to combine a textbook of pharmacology with an index of therapeutics.

The author deals first with the pharmacology of drugs, classifying them roughly according to their chief actions; and in the last third of the book the treatment of different diseases is discussed. The unfortunate gap that exists between the teaching of pharmacology and the practice of therapeutics is notorious, and the attempt Dr. Stevens makes to bridge this gap by including the two aspects of the subject in one volume is laudable, but the arrangement naturally leads to a certain amount of duplication.

The account given of the pharmacological action of drugs is clear and concise, and in most cases embodies the latest information on the subject, although the description is to a certain extent hampered by the absence of illustrations. A few of the statements, however, seem scarcely to represent the latest knowledge. For instance, the production of spinal anaesthesia by cocaine is described, and it is stated that the death rate in spinal analgesia by cocaine probably exceeds 1 in 1,000. Later on it is mentioned that cocaine as a spinal anaesthetic has been superseded largely by less toxic substances, such as tropacocaine and stovaine. This scarcely gives a correct impression of the methods usually practised, for those surgeons with most experience of the method agree that cocaine should never be used as a spinal anaesthetic, and claim that the mortality of spinal anaesthesia is far below 1 per 1,000 when a proper technique is employed.

The general classification of drugs is always a difficult problem, and that adopted by the author might in some cases be improved; for example, the general term "alteratives" is made to include arsenic, iodides, colchicum, and extracts of endocrine glands. The pharmacological section is followed by a section of forty pages describing the action of heat, light, electricity, *x* rays, massage, bleeding, and transfusion. Descriptions are given of the treatment of a selected list of diseases, and in each instance treatment as a whole is described, and not merely drug treatment. But the space at the author's disposal (200 pages) has been too limited to allow him to give a complete account; for instance, rickets is dealt with in one page.

The chief criticism we have to make is that the author has tried to get too much into one volume. In the pharmacological section an account is given of all the drugs in common use, with the result that the actions of the more important ones are described in rather a summary fashion;

[4] *A Text-book of Therapeutics, including the Essentials of Pharmacology and Materia Medica.* By A. A. Stevens, A.M., M.D. Sixth edition. Philadelphia and London: W. B. Saunders Co. 1923. (Med. 8vo, pp. 793. 30s. net.)

and in the section describing treatment the space does not permit of the full account of details which are of such great importance in actual practice.

The volume is, however, one which practitioners will find very useful, for it represents a real attempt to show how pharmacological knowledge of the actions of drugs can be applied to the actual treatment of disease.

REMEDIES OF THE DARK AGES.[5]

After the downfall of the Graeco-Roman civilization the medical system of antiquity was submerged and was recovered only after a lapse of centuries. The scientific elements in ancient medicine were not understood or appreciated by Western minds until the close of the middle ages. The scientific output had ceased altogether with the death of Galen (201 A.D.). Greek medical writings became but abstracts of Galen, and Latin medical writings but abstracts of the Greek, and so yet further removed from their originals. The material continued to deteriorate, but the corner was probably turned with the eleventh century, when new ideas of "Arabian" origin began to enter medicine, mainly through the agency of Constantine the African (died 1087).

This period before Constantine may rightly be termed the "Dark Age" so far as medicine is concerned. The Latin documents that reach us from this period are, in the main, either of the nature of "herbals" or they are receipt books, mere "antidotaria" or prescription lists. The paralysed intellect of the Latin West rejected all theoretic knowledge and concentrated on "practical" ends. This material remains as a lasting object lesson to the world of the hideous results of the exclusive application to immediate aims. That lesson is one of the most valuable that medical history has to teach. The danger is one from which the medical world—even the scientific world—is far from being free at this day.

Dr. Henry Sigerist has made a very thorough, learned, and admirably arranged study of the earlier receipt literature, the documents of which range from the seventh century to the eleventh. The earliest of all his documents is a remarkable manuscript in the Harley Collection of the British Museum which is of great interest to scholars as containing the oldest Latin-Greek dictionary extant. The Harley antidotarium is also memorable as having been once in the possession of that very remarkable Renaissance humanist, the Rhinelander Nicholas of Cusa (1401-1464). This Nicholas exercised an influence on the course of medicine which hitherto has not been adequately recognized. His preservation of this document is one of many instances illustrating his scholarly judgement and foresight.

Dr. Sigerist shows that, even on the wretched level to which the receipt literature had sunk, for century after century the copying was of the most slavish kind. Such accretions as came to these antidotaria were never original but were always from sources already in existence. The spell of antiquity was so much over men's minds that they did not dare to introduce even the current magic into these tables, which, feeble though they are, are on this account singularly free from superstition in the ordinary sense.

Dr. Sigerist has thus presented us with a most valuable study in mental deterioration. He traces his list of remedies back to Marcellus Empiricus of Bordeaux (c. 425 A.D.), Aetius of Amida (c. 550), and Alexander of Tralles (525-605) through a series of "dark age" antidotaria on to the high middle ages and the Renaissance, when these prescriptions were still in vogue, having outlasted a thousand years. Photography has introduced into scholarship scientific comparative methods, comparable to those of the laboratory. Dr. Sigerist in his Zürich home is thus able to study at his leisure manuscripts from London, Glasgow, Berlin, Cambridge, St. Gall, and many other distant libraries. The result is the evolutionary study which lies before us. Its learning differs as much both in kind and degree from the old-fashioned antiquarian research as does a modern biological treatise from an anatomical textbook of the seventeenth century. Science and scholarship thus act and react on each other.

Dr. Sigerist's monograph is a worthy addition to the series of studies issued from the Institute for the History of Medicine at Leipzig over which Professor Sudhoff presides with much energy and learning.

[5] *Studien und Texte zur frühmittelalterlichen Rezeptliteratur.* Von Dr. Henry E. Sigerist. *Studien zur Geschichte der Medizin.* Heft 13. Redakteur, Karl Sudhoff. Leipzig: Johann Ambrosius Barth. 1923. (Double demy 8vo, pp. vii + 219.)

MALIGNANT DISEASE OF THE INTESTINE.

In his work on cancer of the intestine[6] Professor Okinczyc has produced a very detailed and complete account of malignant disease, sarcoma and carcinoma, of the several segments of the bowel (duodenum, jejuno-ileum, vermiform appendix, and colon). Of cancer of the duodenum it is stated, in contrast to the general opinion in this country, that the duodenum is more frequently the seat of epithelioma than any other part of the small intestine and that three-fourths of the epitheliomas of the small intestine are found in the duodenum. The majority of these occur at the bile papilla, but 25 per cent. are stated to arise above or below the papilla. In treating of carcinoma of the jejuno-ileum, reference is made to the frequency with which acute obstruction is the first symptom to be brought to the notice of the surgeon. On the other hand, an early and rapid alteration in the general health is recognized as one of its most constant symptoms. A diagnosis is rarely made before operation.

The mortality after operation depends upon the presence or absence of acute obstruction; if this is present the mortality is 70 per cent., if absent 17.6 per cent. With regard to the remote prognosis, cases are reported of survival for more than seven years after operation. Sarcoma of the jejuno-ileum is stated to be more frequent than carcinoma, and it occurs in three forms—circumscribed, diffuse, and pedunculated, the last projecting into the lumen or on the surface of the bowel. It differs from carcinoma in its slight tendency to produce stenosis.

Carcinoma of the vermiform appendix is met with as a columnar-cell or spheroidal-cell growth, the latter being the more frequent. The spheroidal-cell variety occurs in young subjects (maximum twenty-four years), and shows no tendency to produce metastases or to recur after removal. It has been regarded by Oberndorfer as similar to the basal-cell growths met with in various parts of the intestine, and termed by him "carcinoids."

In the description of cancer of the colon stress is laid on the importance of appreciating the initial symptoms. The disease produces general effects by repeated haemorrhages or by toxic action, or local effects by irritation, and according as one or other of these predominates the initial symptoms will assume the form of symptomatic pernicious anaemia, dyspepsia, or enteritis. Cases are cited in which valuable time has been lost in treating the disease as a gastric affection. The author deprecates the tendency to individualize each localization of the growth in the several segments of the colon. Cancer of the transverse colon possibly deserves a separate description, but for the rest it is convenient to classify the cases in two groups, those of the right and those of the left colon. Cancers of the right colon are generally large, fungating, with no great tendency to cause stenosis, rapidly adhering to surrounding parts and often infected. Those of the left colon are more often small, stenosing, scirrhous, and rapidly complicated with obstinate constipation and occlusion. The author gives a very clear account of the numerous operative procedures that have been designed for the removal of the growth, illustrated by twenty-three diagrams of the different operations. In a series of resections of the colon performed during the last twenty-five years the immediate mortality was 39.7 per cent. Other series show considerable variations from this figure; but in those statistics which are based on not less than forty cases the mortality becomes almost the same, and varies between 35 and 48 per cent. One of the most successful series is that of Vuichoud, comprising twenty-eight excisions with three deaths; of the fifteen cases living

[6] *Cancer de l'Intestin.* Par J. Okinczyc. Bibliothèque du Cancer: H. Hartmann et L. Bérard. Paris: Gaston Doin. 1923. (Roy. 8vo, pp. 236; 78 figures. Fr. 15; post free fr. 16.50.)

at the time of his report, one had recurrence; nine of the cases had died; the history of one could not be traced; and the survivors had lived from one to twenty years after the operation.

HUMAN EMBRYOLOGY.

THE manual of human embryology[7] written by M. VIGNOLI is a primer or synopsis composed at their request for first and second year students. The author states that at first he refused the request, but finally decided that a book of the kind was needed, since the student of to-day has too little time at his disposal to permit of his devoting more than a week to the study of embryology and requires only summary notions of the subject, enabling him to pass his examinations and comprehend the development of the principal organs. The aim of the book is therefore modest and does not embrace more than the A, B, C of the subject, which is presented in a purely diagrammatic form. Such being the author's aim, it may be said that he has carried it out with great skill. The arrangement of the subject matter is good and the descriptions, although short, are clear and sufficient. The author has made a point of rendering his statements comprehensible to the student; every page, before going to press, was submitted to a student and passages considered to be obscure were rewritten.

The book contains one hundred and ninety-six diagrams and there is scarcely a statement that is not illustrated in the figures. It is divided into three parts. The first includes the study of fecundation, segmentation, the development of the embryonic area, and the differentiation of the embryo and adnexa. The second part includes the development of the extra-embryonic part of the ovum and the embedding of the ovum in the uterine mucosa. The third deals with the development of the embryo and its principal organs; and the fourth with the full-term foetus and membranes. An explanatory list of embryological terms in common use is given in an appendix.

NOTES ON BOOKS.

A THIRD edition of the *Manual of Instruction for the Royal Naval Sick Berth Staff*[8] has been issued by H.M. Stationery Office. It has been prepared by Surgeon Commander G. O. M. DICKENSON, R.N., who has thoroughly revised the volume and rectified several errors of omission and commission. The alterations thus effected, according to the author, are of an extensive character. The thirty-three chapters cover a very wide range of medical subjects—from somewhat more than elementary instruction in anatomy and physiology to descriptions and treatment of surgical conditions and diseases, both general and systemic. General nursing, cookery, anaesthetics, pharmacy and dispensing, stretcher drill, saluting regulations, preparations for a naval action, landing parties, care of the feet and of surgical instruments, and a variety of subjects which probationary sick berth attendants and sick berth staff are expected to know complete the volume. One can only say that if they assimilate all that is contained within the covers of this manual they will have a very wide elementary knowledge of the science and practice of medicine and surgery. In some respects the information contained in it is not quite up to date. It would be as well, for example, to emphasize in a future edition the use of the Thomas splint for fractures of the extremities. Its use for this purpose is only cursorily noted, whereas, as the result of experience in the late war, it is in the R.A.M.C. training one of the most important features in the instruction of the orderlies. Again, although there is much detailed instruction regarding bacterial infections, toxins, and antitoxins, there is no mention of the prophylactic use of inoculations in the description of enteric fever. Amongst the many diseases described, including encephalitis lethargica and sleeping sickness, there is no mention of sandfly fever, which is so common on the Mediterranean littoral, and would therefore be, it might be supposed, of some importance to the naval sick berth staff. The risk of overcooking of vegetables and meat—an extremely practical point in the prevention of scurvy—has not been noted. It is suggested that the author in a future edition might consider these points. The print is clear and the illustrations numerous and good.

[7] *Manuel d'Embryologie Humaine.* Par J. Vignoli. Paris: A. Maloine et Fils. 1923. (Cr. 8vo, pp. 180; 196 figures. Fr. 8.)

[8] *Manual of Instruction for the Royal Naval Sick Berth Staff.* By Surgeon Commander George O. M. Dickenson, M.B., B.S.Durh., R.N. London: H.M. Stationery Office. 1923. (Cr. 8vo, pp. 529; 262 figures. 2s. 6d. net.)

MEDICAL DEFENCE UNION.

THE annual general meeting of the Medical Defence Union was held at the Royal Hotel, College Green, Bristol, on Saturday, September 29th, 1923. The President, Sir Charles Ballance, K.C.M.G., C.B., M.V.O., occupied the chair, and upwards of thirty members were present.

In moving the adoption of the annual report of the Council for the year 1922-23, the President said that he was glad to be able to congratulate the members upon the continued expansion and satisfactory progress of the Union. On only one previous occasion had the annual meeting been held in Bristol, and that was fourteen years ago. At that time the membership was approximately 7,700; now it was over 10,700. The income of the Union then was only a little over £4,000; now it was over £10,000, and with this improvement in the financial position the Union was able to do far more for its members than formerly. Every additional member meant greater protection for all, and medical practitioners should realize that in joining the Union they were not only protecting their own interests, but were doing something for others. One noticeable feature of the last few years had been the increase in the number of women members. Over 400 women doctors had now joined the Union. Three women were on the Council, and their advice had been most helpful in many cases.

Efforts had recently been made to induce the Union to make some concession to those practitioners who were also members of the British Medical Association, but the Council had declined to make any differential treatment in favour of B.M.A. members. Similar overtures had been made to the London and Counties Medical Protection Society, with the like result. Both the protection societies felt that they were mutually concerned in maintaining complete independence, and with a view to the promotion of good feeling, and, where necessary, co-operation, a Standing Joint Committee, consisting of representatives of each society, had been constituted and would meet at regular intervals.

The transfer to the new offices in Bedford Square had been effected without any serious interruption to the work of the Union, and the change was much appreciated. In view of the higher costs of litigation, the Council had thought it prudent to raise the amount of the insurance indemnity after January 1st next to £3,000, the improved financial position of the Union enabling the Council to provide the additional cover without any increase in the annual subscription to the Union.

The President specially pointed out that charges of negligence and malpraxis against medical practitioners were no less frequent to-day than formerly. By far the greater number of the allegations which doctors were called upon to meet were a mere pretext for evading the payment of professional accounts. He could not conceive how anyone engaged in active practice could be so foolish as to refuse to avail himself of the protection which an organization such as the Medical Defence Union afforded. He regarded membership of a defence society as equally important with registration as a medical practitioner, and was glad to find that the newly qualified were joining the Union in increasing numbers.

The annual report of the Council and the statement of accounts were adopted.

Dr. M. Hallwright, Dr. W. Rigden, and Dr. H. Robinson were re-elected members of the Council.

On the recommendation of the Council the following resolution was unanimously adopted:

> "That the Council of the Medical Defence Union, having full discretion under the articles of association as to the cases which it shall undertake on behalf of a member, shall have full discretion in any case in connexion with divorce proceedings to withhold or partially withhold the indemnity insurance afforded to members in respect of damages and costs of the other side which may be awarded against them."

A hearty vote of thanks was accorded to the President and Council for their services during the past year.

The Council, at its meeting on October 4th, unanimously appointed Mr. Walter G. Spencer, O.B.E., F.R.C.S., president of the Union for the ensuing year.

MOTOR NOTES FOR MEDICAL MEN.

By H. MASSAC BUIST.

FEATURES OF THE FRENCH MOTOR SHOW.

The eighteenth international Automobile Salon in the Grand Palais will close to-morrow (Sunday, October 14th) and the seventeenth international Passenger Car Show promoted by the Society of Motor Manufacturers and Traders, under the patronage of the King, will be opened to the public at Olympia, Kensington, on Friday, November 1st. But it will be preceded, on Monday next (October 15th), by the yearly international Motor Cycle Show, which will, therefore, be the first of the motor exhibitions to be held in the enlarged building. The Paris Motor Car Show is purely French as regards 85 per cent. of the exhibitors. The British industry is represented by two makes of cars only, the Austin and the Rolls-Royce, the 7-h.p. chassis of the former make being the only example made in this country with a 4-cylinder engine of 1 litre capacity only, whereas French builders make several machines in this category. Owing to the state of the exchanges and to the 45 per cent. import duty, the British exhibitors in Paris are in much the same case as the American—they can be there for the sake of show, scarcely for business. General Motors, the great corporation that produces Chevrolet, Buick, Oakland, and Cadillac vehicles, is represented by a fine exhibit, especially of Buick and Cadillac machines, the three larger makes having brakes to all four wheels; this is a new feature of many American-made cars, as will be seen at Olympia, but a familiar thing in the cars of many of the leading French makers. No British exhibitor shows any chassis with four-wheel brakes in Paris, though many will be standardizing them or offering them as an option at Olympia, including Armstrong-Siddeley, Austin, Aston-Martin, the new 14-h.p. Bean model, Bentley, the new Beverley-Barnes, Deemster, H.E., the new 6-cylinder 21-h.p. four-speed Lanchester, Sunbeam, Talbot-Darracq, Vauxhall, Warwick, and Waverley.

Front Wheel Brakes for Popular Priced Cars.

The first big effort by the French industry to introduce front wheel brakes was made five years ago. Much has been learnt by French automobile engineers in the interval. M. Henri Perrot's patents for diagonal application, and so forth, have been combined with those of Captain Hallot, the inventor of servo mechanism; and a vast variety of engineering talent has been brought to bear on detail of problems of axle design, suspension, and so forth. The result is that, in regard to the application to standard cars, the development is in a satisfactory state as far as the French industry in general is concerned because its members have made many mistakes and learnt much. Further, the engineering talent brought to bear on the subject by Delage and Hispano-Suiza among standardized car builders, and by Talbot-Darracq among firms that experiment by way of racing, has had very valuable results. M. Perrot, who is regarded as the man with most experience in the world on this subject—more than half a generation of it, considers American automobile engineers as a class to be at the same point to-day that French firms were in this respect five years ago. Like the French, he expects the Americans will have to spend quite a couple of years experimenting before they develop front wheel brakes which can be placed in the hands of the ordinary user with perfect safety. Nevertheless, some American manufacturers, including General Motors, are using certain of his patents under licence; this comment applies to the general, not to the individual, American case. French experience to date, which extends over 20,000 cars of various makes in the hands of private owners, has proved that some sort of servo mechanism is absolutely essential for all but light and comparatively slow cars.

From the technical point of view front wheel brakes should not be studied as a brake problem only. Suspension and steering are so intimately related to brakes on the front wheels that the three must be considered as one problem; hence the difficulties. It is surprising to find that the use of any servo mechanism is almost entirely absent from the American designs. By contrast, in the designs used in this country by the more responsible engineering houses of the widest experience it is observable that there is no hesitation about working the Perrot-Hallot patents under licence. But, as among the French makers, so among the British, such firms as Bentley, Lanchester, Sunbeam, Vauxhall, and others show extraordinary fertility of inventive resource, each dealing on wholly original lines with a number of ancillary problems hitherto overlooked.

Of exhibits at the French Show there is nothing much to add in respect of brake design, because undoubtedly the leading automobile engineers have there solved practically all the problems necessary for safe use in the hands of the public. It is observable this year that the leading axle makers are offering special axles, complete with front wheel brakes, thus making it comparatively an easy matter for car builders to apply these component units to their chassis.

A point which will interest medical men is that the 10-h.p. Renault models are now fitted with front wheel brakes. Again, Chenard-Walcker produces one chassis on which there are brakes on the front wheels only, and none on the back, an independently controlled brake operating through the transmission. There have been some changes in regard to the front wheel brakes and axle mechanism of the nominal 30/40-h.p. overhead valve 6-cylinder engined Fiat introduced last year. It has now been developed in detail to an extent that enables it to be standardized on a large scale. The 15/20-h.p. Fiat has lightweight aluminium pistons with thin cast-iron skirts.

Overhead Valve Engines on the Increase.

A census of the valve systems used at the Paris Show reveals that there is no question about the overhead valve gaining in favour at the expense of the side-by-side setting. It is observable that the French industry does not fit overhead valves for the mere sake of falling in with an assumed vogue. Practically all the builders employing this system of valve gear do so to obtain greater economy and greater power; and, what is not invariably the case in this country, they achieve both. The 8-cylinder-in-line engine tempts many manufacturers, including Rolland-Pilain, who have employed the type for racing, and Chenard-Walcker, who produces one with 69.5 by 130 mm. bore and stroke measurements. The latest Chapuis-Dornier engine produced by that firm of specialists, whose products are fitted to many Continental vehicles, is a 4-cylinder unit with overhead valves and only 1,100 c.cm. volume, the bore measurement being 59 mm. and the piston travel 100 mm. In nearly all designs the overhead valve gear is worked by push-rods and rockers enclosed in aluminium covers, this being the cheapest of the really effective forms of operation. The little Dornier power plant develops 20-h.p. on the Froude brake. Peugeot introduces a 10-h.p. model with 4-cylinder overhead valve engine, having detachable cylinder heads. De Dion-Bouton introduces a 20-h.p. 4-cylinder overhead valve engined chassis of 95 by 140 mm. cylinder bore and stroke, as does Rochet-Schneider. On all the larger Renault models this firm's small car practice of placing the gearbox on the front end of the torque tube is exploited. Delage uses a 4-cylinder overhead valve engine for his new 12-h.p. car. The motor has a five-bearing crankshaft, forced lubrication, and the chassis a gearbox giving four speeds forward and, of course, brakes to all four wheels. Both Citroën models remain without any important changes. From Belgium there are sent Minerva and Métallurgique cars of the smaller middle size with brakes to all four wheels.

A Cheap, Light, Silent, Covered Body.

There are in the Salon various examples, including those standardized on the Delage and the Talbot-Darracq chassis, of the patent Weymann silent, cheap, lightweight, flexible, durable, easily cleaned, covered body schemes, the British rights of which were acquired by the Rotax Motor Accessories, who have granted licences to Daimler, Rover, Sunbeam, and Talbot, among others; these firms will standardize this class of coachwork from the November London show onwards. I made a test of this type of bodywork on a large 40-h.p. Renault chassis, driven by the holder of the French aeroplane records, including sundry world's records,

which is another way of intimating that the tests of silence and so forth were very searching. The principle of the construction is to embrace a considerable amount of aeronautical engineering practice. Nevertheless the lines of the coachwork can be made whatever the purchaser desires. The main features of the constructional scheme consist of putting a flat platform on the chassis, and mounting the seats, instrument board, and so forth on that, the sides and roof of the covered body being a quite independent unit, and constituting a shell. It is a cheap body to make; and no coachwork so durable has been brought forward before. The one point of objection may be that, when it is brand new, it has not that mirror-like surface that can be got by ordinary systems of construction. Against this is the fact that these surfaces deteriorate sadly in anything from a month to three months' service; whereas the Weymann finish remains in its pristine condition for two or three years and, even thereafter, it is practically none the worse for wear. Things can be done with this construction impossible with any other. Thus a door may be forcibly twisted sideways, but on relase flies back into its normal shape, none the worse. A very ingenious cam action is the principle of the wholly original door-lock, ensuring silence and absolute security. The lightness of the construction enables a chassis to behave with full scale, luxuriously equipped, and large covered body as though it had a two-seat open racing shell on it. For instance, on a large Renault the whole body, including the very ample cushioning and so forth, scaled 5¼ cwt. only, with all the usual glass and so forth.

What Doctors Need.

All the joints in this type of body are separated, as to their component parts, by canvas. The panelling is of a special synthetic leather which has some quite extraordinary qualities. For instance, in hot summer weather the car may be driven all day in scorching sun with an opening in the front windscreen only, so that the driver is protected from heat and dust, yet on getting out, though he will find the panels bulged somewhat here and there, yet by the time he has had lunch the coachwork will have reassumed its normal shape. In like fashion one of these panels may be punched really hard, and a welt raised on it. But, again, after a short time search for the blister will be in vain. Rather a curious story attaches to this quality. The inventors thought that, if this material were so serviceable for coachwork, what a fortune could be made in boots! After wearing boots fashioned of this synthetic leather for a fortnight, however, and finding that they came back to their original shape every morning, so that the user had the discomfort of putting on brand-new boots every day, it was realized that this quality was rather a disadvantage than a gain. All the sliding windows of the Weymann bodies are fitted in rubber channels. This body is, in effect, resilient and free from strain. The methods of construction and the materials used enable wringing stresses to be withstood; and the rattle-free condition of the machine is permanent. This type of coachwork has other important qualities from the point of view of the medical man in that, whereas one dare not dust an ordinary body because the surface would become scratched and lose its gloss, and one has to be very particular about washing for the same reason, by contrast this type of panel can be washed or dusted, in quite an unskilled fashion, without the vehicle losing its original appearance. The cheapness enables a limousine, or saloon body, as well as the landaulette type, to be produced at a cost not exceeding 10 per cent. more than that of constructing an open touring type body, the weight being approximately three-fifths only of the weight of a body of a similar style constructed on ordinary coachbuilding principles. Altogether it constitutes a very notable development of prime interest to the medical man at this juncture. There is nothing experimental about it, the type having been tested over several years. Further, never has such a degree of engineering knowledge been brought to bear on the problem of coachwork construction as is embodied in the very clever framework employed by the Weymann principle. And the saving of voice strain in the course of a day's run has to be experienced fully to be appreciated.

Large Section, Low Pressure Tyres.

In 1916 the Dunlop Company experimented with large section, low pressure tyres. At the Paris Show a number of vehicles, particularly of the smaller sorts not over well sprung, are exhibited with proportionately very large section Michelin tyres, which will constitute a feature of exhibits at the forthcoming show at Olympia, where a number of vehicles will also be shown with Dunlop tyres evolved independently on this principle. From the purely technical point of view it should be pointed out that this is quite a different thing from fitting over-size tyres because these new style "comfort" or "balloon" low pressure, large section tyres are set on very wide rims, so that the strain on the walls is reduced materially. The main object is to ensure comfort on an ill-surfaced road. In other words, the tyre industry is here bringing forward something to cover the faults of the automobile engineer who does not understand springing, or who has not the money at his disposal with which to supply adequate springs to his vehicles. At an earlier period I should have regarded the development as dangerous. But now that the corded tyre principle can be exploited without infringing patents and is, therefore, being taken up universally as being by far the best method of cover constructing, these tyres can be run under conditions of relative abuse with much greater safety, and under-inflated to give very much better results along these lines than have been attained hitherto. Michelin offers 715 by 115 mm., 750 by 130 mm., and 775 by 145 mm. "balloon" or "comfort" tyres to replace the 80 mm., 90 mm., and 105 mm. sections.

One inevitable result of this new movement, however, will be that people will run anything from pedal bicycles to motor cars with ordinary tyres at low pressures. Than that nothing could be more extravagant, or dangerous. Such pneumatics are not designed for running below the pressures specified and there is grave risk of them coming off the rims at corners, and so forth. The over-size "comfort" tyre, as the new type is styled which is being produced by the industry both in the Old and in the New World, is designed for the special conditions it has to fulfil. Michelin even introduces a special type of safety ring which prevents a deflated tyre coming off at high road speeds, as has been demonstrated on the Continent on some racing cars. The roads there are less satisfactory on the whole than in this country and, of course, cars are driven at vastly greater speeds, for one thing because the open, level, and straight roads encourage that; for another because the surfaces are not treated for dust, therefore you must scorch or be choked with dust of other folk's raising. A number of automobile engineers who have tried these tyres on their cars state that the increase of comfort is great. But they find that when corners are taken at high speed, they seem to experience an inclination to sea-sickness.

There are many other interesting inventions in the Paris Show, but the majority are of no more than academic interest to medical men; incidentally, this applies to Mr. George Constantinesco's new form of transmission to dispense with clutch, gearbox, and back axle drive on a motor car. Whatever its merits this could not be standardized by manufacturers in this country for the coming season. The device has been evolved by the inventor of the "C.C." gear whereby machine guns were fired in war time through propellers of aeroplanes.

The Cambridge University Press has recently published for the Cambridge Philosophical Society the first number of a biological part of the *Proceedings* of the society, which until now have contained, in a single series, mathematical, physico-chemical, and biological papers. In separating the biological papers from the others it is hoped that a medium will be established for the publication of biological work of general interest done in the various departments of the university and possibly elsewhere. A Publication Committee, consisting of professors and other representative biologists, has been appointed. It is proposed to issue the new *Proceedings* in quarterly numbers.

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THE REMUNERATION OF THE INSURANCE MEDICAL SERVICE.

NOT very far short of one-third of the total population of Great Britain is provided with its ordinary medical attendance and treatment through the National Health Insurance system. By no means all of these persons need the provision which the State has made for them: some never take advantage of it at all. Many insured persons are well paid weekly wage-earners; many others are members or dependants of well-to-do families. Most of these would receive the medical attention they need through the ordinary method of private practice if the insurance system were not in existence. Nevertheless, it is to be reckoned a national advantage that the remainder, constituting the great majority of the insured population, should have this help in obtaining medical attention, and it is an asset to the profession as a whole that this work should be provided for it with the certainty of regular payment therefor quarter by quarter.

The State, being responsible for the establishment and administration of this system, and paying fully two-ninths of the cost thereof, quite properly makes provision for defining the range of service which doctors shall be expected to give in connexion therewith and the general conditions under which this shall be given, and for securing that the duties undertaken shall be carried out with reasonable care and efficiency. So long as there is no interference between doctor and patient as to the actual advice and treatment given, and so long as any penalty falls only upon those who have wantonly broken or failed to perform a contract into which they have chosen to enter, regulations and arrangements must be accepted as a necessary inconvenience; though unfortunately rules have a tendency to become more complicated, and helpful supervision to degenerate into unhelpful inspection. There are many general practitioners who do not care to enter into any contract at all; these stand apart from the service. There are others who do not join the service because they feel a sufficiently strong dislike to some particular conditions of the actual contract which have to be accepted. The essential things in this connexion are that the profession shall have its full weight in deciding the terms and conditions, and that those who are chosen to conduct negotiations on its behalf shall be fully aware of professional opinion and sympathetic towards the traditions of the profession.

The community, however, should, and presumably does, require from a service like this something more than the mere treatment of individual persons when they are ill. To alleviate suffering and to cure sick persons is doubtless a national as well as an individual advantage; but it may be of even greater importance in the long run to use preventive methods by giving advice and instruction with regard to personal, domestic, and workshop hygiene, to use the unrivalled opportunities which such a service provides for research into the beginnings of disease and other cognate problems, and to gather and supply any information which may reasonably be required from time to time by local or central health authorities. Practitioners who enter the service undertake important duties to the State as well as to their individual patients, and there is no reason why there should be any clashing between the two functions—at any rate to a greater extent than is sometimes inevitable in any kind of medical practice.

Such a service is obviously an essential basis for wider things in two directions. It is the fundamental benefit upon which any other benefits of the insurance scheme depend. Without it, sickness benefit and disablement benefit in the form of cash payments, maternity benefit, and any other additional benefits such as dental, ophthalmic, nursing, or convalescent, could not be economically given or wisely used. Hence arises the extreme importance of medical certification for the success of the scheme. The general practitioner medical service, too, is the foundation on which any further expansion or extension of consultation or specialized work, whether for diagnostic or therapeutic or research purposes, must be built. Such a development of the service, involving the co-operation of hospital staffs, pathologists, radiographers, and other members of the profession, has long been foreshadowed. But without an adequate and thoroughly efficient general practitioner service as the first stage, these developments would fail of half their usefulness and would tend to become a wasteful extravagance.

It might be supposed that the enormous importance of this service, so extensive, so powerful for national health purposes, so essential for the safeguarding of other expenditure, and so fundamental for future developments, would be obvious to any Minister of Health. Yet in the official attitude towards the present negotiations as to the terms of service for insurance practitioners after the end of this year there has been so far no evidence of wide outlook, of real vision, or of statesmanlike grasp. It is obvious that if the insurance medical service is to be useful to the community and worthy of the nation, it must make its appeal to the great body of the profession, it must attract such numbers of the practitioners as will lead to a wide distribution of insured persons among doctors of their own choice who will have time to do good work without distinction between one class of patient and another. To do that it must enlist and retain the help of successful and experienced practitioners, as well as those who are just entering the profession and those who are constrained to remain in the service by sheer economic need. The whole profession will support the Insurance Acts Committee in saying that the level of remuneration should be directed to this end, and it is to be expected that public opinion will also declare that it is not sufficient for the Minister merely to ask himself, "What is the lowest fee for which I can get a number of doctors to treat insured persons when they are ill, and to give the necessary certificates?" What is the reason for this shortsightedness?

The 14,000,000 insured persons are mainly grouped in approved societies. They are compelled so to group themselves if they wish to reap the proper advantage from the insurance scheme, but only a very small fraction of them take any interest whatever in the constitution or administration, or even in the rules, of the society to which they belong. The great majority, having joined a society, have no further real connexion therewith; many even do not know which society they are members of. Yet the officials of these societies technically "represent" insured persons; they administer all benefits other than medical benefit,

and are thus the distributors of large sums in cash benefits weekly; formally they have an extensive control over the National Health Insurance Fund through which vast sums of money, contributed by insured persons and their employers, and added to by the taxpayers, pass every year, and out of which credits are assigned to the various societies according to their membership. Some of these societies are very large; some are very small. Some are highly centralized; others have thousands of branches throughout the country, and for purposes of valuation and many other purposes these branches are autonomous units. All of them have secretaries, large or small. Many other offices in societies and groups of societies have been created. Some are filled wisely; some not; this is natural enough. Altogether there has grown up in this way a great vested interest, with great power for good or otherwise, in organized communication with millions of people, controlling or having powers of obstruction with regard to large sums of money, and wielding therefore a great political influence.

From the beginning the medical profession has seen that one of the dangers of the insurance scheme was that approved societies might become so dominant as to usurp the place of the community, and by dictating to Ministers control the whole service, including medical benefit, from the administration of which they were, as such, excluded by the efforts of the medical profession in 1912. Recent events have shown that this danger has become a real one. The profession has shown its willingness to provide the services which the State asks for, and to arrange with the representatives of the whole community—Parliament, the Minister of Health, and the Government—the terms on which it will provide them, but it may be taken as certain that it will unite in refusing to become subservient to any particular section, however powerful. The representatives of approved societies are now engaged in directing the Minister of Health what fee he must pay insurance practitioners for their services, and forbidding him to advance one penny on what they are willing he should give. The view they take is narrow, but the Minister seems himself to have adopted it: it is that the sum must be the lowest for which any barely sufficient number of doctors can be obtained to attend their members when ill. We are sure that many of the officials of the societies appreciate the unwisdom of this attitude, and we still hope that the Minister will take the wider view of national needs and possibilities, and so secure the willing services of the main body of general practitioners of all types.

The case of the Insurance Acts Committee, the constitutionally authorized executive of the insurance practitioners and of the whole British Medical Association in this matter, is that for many months past it has been trying to cultivate friendly relations with all concerned in the insurance service, including the representatives of approved societies, that it has suggested or accepted remedies for all those defects of the service which were considered important, and that for such a service, in its national and individual aspects, no fee less than the 9s. 6d. at present given can be justly offered. If the arbitration award of 11s. in 1920 is taken as just, it is difficult to see how any sum less than 10s. 4d. should be paid in present conditions; but this is not insisted on, although no argument in the Minister's reply shakes the conclusion reached. Viewed in another way it is found that the fees derived from private practice or from much non-State contract practice among the classes of society from which insured persons come alike compare favourably even with the present capitation fee. The acceptance of 8s. 6d. would necessitate a standard of living appreciably lower than that of pre-war times, even expressed in its lowest terms, and without regard to the effects of increased taxation. It is certain that the lowering of the fee would have its reaction on the rewards of all branches of professional work; and this fact, together with the other questions of freedom from approved society dominance, and of avoiding any set-back to the development of an insurance medical service which will be worthy of the profession and of the nation alike, constitutes a situation which must be viewed with grave concern and which calls for united and immediate action.

The reasoned reply by the Insurance Acts Committee to the Minister's offer (SUPPLEMENT, October 6th, p. 149) is printed in this week's SUPPLEMENT (p. 161). The matter is now in the hands of the Local Medical and Panel Committees, which will send representatives to a Conference to be held in London on October 18th. At that Conference most important decisions must be taken. There is little time to secure a satisfactory adjustment; but we hope that the Minister of Health may yet be able to make some further move that will enable a full, contented, and nationally useful service to be established.

PELLAGRA.

WE publish this week an account, illustrated by photographs on a special plate, of two cases of pellagra recently observed in the Hospital for Sick Children, Great Ormond Street, by Drs. Robert Hutchison and Donald Paterson. The disease appears to have been more commonly observed in Italy than in other countries; it was recognized there first as a distinct disorder early in the eighteenth century, and still prevails to a considerable extent. It has been observed also in France, Portugal, Austria, Hungary, Rumania, Macedonia, Egypt, and in some parts of the North of France. In the British Isles a case was recognized by Brown as long ago as 1860; another case was noticed by Cranston Low in Scotland in 1909; and in 1913 two cases were reported in our columns by Dr. C. R. Box from St. Thomas's Hospital. His paper was illustrated by coloured plates (1913, vol. ii, p. 2) showing the appearance of one of the patients and the histology of the nervous lesions described by Sir Frederick Mott in a paper also published in that issue. The two patients were brothers, and both died. The family had resided first of all at Leyton in Essex, afterwards at Catford (within the Metropolitan area), and later at Slough, Buckinghamshire. In 1914 Dr. Box recorded another case in our columns (vol. ii, p. 397); this patient also was a child, and the disease appears to have begun at the age of 1 year and 8 months, while she was residing at a village in Yorkshire. Of the two patients whose cases are now recorded by Drs. Hutchison and Paterson, one had lived in a village near Ipswich and at Walthamstow, Essex; the other at Acton, Middlesex—districts which can both be described as within the confines of Greater London.

The writers of the paper published this week state that their main object is to draw the attention of clinicians in this country to the fact that pellagra is really endemic in England. As the diagnosis, except in typical cases seen during the spring and summer months, or when the rash is well marked, is not easy,

they think it probable that a considerable number of cases remain undiagnosed. On these points they are in agreement with statements in the *Manual of Tropical Medicine* by Castellani and Chalmers. It is there said that for the diagnosis of pellagra two conditions are necessary: first, the observer must suspect its presence and be on the look-out for it in any and every country; and secondly, he must not be unduly swayed by any etiological theory, but be prepared to make a diagnosis of pellagra in a person of any age, any race, any social condition, living in any place, whether tropical, temperate, or frigid, and in any town or country. They also make special mention of the fact that in lunatic asylums the possibility of the occurrence of the disease should always be borne in mind. This admonition is reinforced in the recent report of the Board of Control for 1922. It is there stated that in the six years ending 1918 the number of deaths attributed to pellagra in mental hospitals in England and Wales was 45 (39 females, 6 males). In 1919 there were no deaths from this cause, but there were 2 in 1920, 1 in 1921, and 18 in 1922; of these 21 cases, 18 were in females and 3 in males. Most of the 66 deaths in mental hospitals in the ten years 1913-22 occurred in the Lancashire County Mental Hospital at Rainhill. In a note appended to the report Dr. G. A. Watson states that during the years 1913 to 1918 inclusive 36 cases in all were definitely diagnosed there. Several other cases of central neuritis were observed in which the typical dermatitis only was wanting to complete the clinical picture of pellagra. During 1922, 14 new cases were diagnosed in this mental hospital (3 males and 11 females). The symptoms in almost all are described as very typical. Dermatitis, always present on the back of the hands and wrists, was very frequently seen also on the face, neck, and various other pressure areas, such as the knees, elbows, and scapula. The character and distribution of the dermatitis are well shown in the photographs reproduced in the special plate published this week. At Rainhill it was invariably symmetrical; its extent and severity, however, had little or no relation to the other symptoms. The gastro-intestinal symptoms were marked in all the patients except one, a woman who recovered; they consisted of diarrhoea, accompanied in some cases by vomiting, in most cases by stomatitis, and in one by extensive ulceration of the tongue. The nervous symptoms were chiefly paresis, especially of the lower limbs; in some instances the nervous symptoms came on suddenly, with exaggerated knee-jerks, jactitation or choreiform movements of the limbs and face, and frequently with a peculiar alteration of articulation.

When all allowance is made for our want of familiarity with pellagra and the real difficulties of diagnosis except in well marked cases, it nevertheless seems probable that the disease is uncommon in Great Britain, though it is certainly one which ought to be borne in mind, especially in cases of diarrhoea with occasional dermatitis in children.

THE MINISTRY OF HEALTH.

CORRESPONDENCE between Dr. F. E. Fremantle, M.P., and the Prime Minister, dealing with the reorganization of certain Government departments, has been published. Dr. Fremantle suggested that the Ministries of Health and Education should be combined, that housing should be transferred to the Office of Works, and local government to the Home Office. While admitting that any such changes require further investigation, Dr. Fremantle expressed the view that they would be practicable and advisable. The true progress of public health, he argued, "is due to intelligent use of the human factor throughout the whole machinery of government—in factories and workshops under the Home Office, schools under the Board of Education, ships under the Board of Trade, throughout the Services and Colonies and Dominions, in fact in every department of local or national government, as well as in what, because of former deficiencies, have been looked on as works of sanitation—water supply, sewerage—or housing or hospitals, which only go to repair the failure of the health factor throughout national life under all departments of government. But the two activating principles of public health are research (under the Privy Council) and public enlightenment, which surely should come under the Board of Education." Dr. Fremantle went on to say that the outstanding and continuous decline in infant mortality since 1900 was shown at the Portsmouth meeting of the British Medical Association to be mainly due to public enlightenment. "The main value to public health of medical officers of health," he continued, "is as a centre of public enlightenment; and it is as well that they should also be, as they often are, the school medical officers. The knotty problem of the medical services under the Ministry of Health and Board of Education—still awaiting solution—would be solved by fusion of the two departments." In conclusion Dr. Fremantle said that while he was aware that some would wait for a complete anatomy of our whole system of local government by Royal Commission, he himself believed that it would be wise and useful to begin by the regrouping he proposed. His suggestion has been interpreted as amounting to the abolition of the Ministry of Health. It was so taken by the Prime Minister, who, in his reply, spoke of the proposal as one for "redistributing amongst other existing departments the functions now assigned to the Ministry of Health." To such a proposal Mr. Baldwin objected on general grounds. The problem, he said, was one of exceptional difficulty, and the result of basing a policy on *a priori* generalizations might be the reverse of successful. In the sphere of business, he continued, it is never a safe rule to assume that whatever is logical is also expedient. So important a problem of administration, he held, "should be closely studied from every angle (including choice of a suitable moment) before a final decision is taken to tear up everything by the roots or to leave everything alone." His considered conclusion is that "any attempt at the present moment at concentration on a big scale would be premature and inopportune and might easily lead to the loss of far more money than, on any reasonable assumption, it might be expected to save, as well as to decrease of efficiency." In reply to the Prime Minister's letter Dr. Fremantle did not specifically repudiate the suggestion that his proposal would amount to the disappearance of the Ministry of Health by the distribution of its duties to other Government departments. We can see many advantages in bringing the school health service directly under the Ministry of Health, but on the other hand would deplore any change which would result in relegating the central administration of public health once more to a subordinate position. In saying this we believe we express the opinion of the medical profession as a whole. We cannot believe that the abolition of the Ministry of Health as an independent Government department would be approved by the profession or be to the advantage of the public.

THE JAPANESE PATHOLOGICAL SOCIETY.

THE Japanese Pathological Society is a very active body, and the last volume of its transactions (vol. xii) contains several contributions of interest. In it Suzuki describes experiments which he considers throw light on the nature of nephrosis (chronic parenchymatous nephritis).

He fed rabbits for about six months on the ordinary diet (tofukara), to which fresh meat was added. No renal symptoms or microscopical changes in the kidneys resulted. At the end of the period the meat was withheld, whereupon the appetite gradually diminished, the animal wasted, albuminuria appeared, and in many cases death ensued. Oedema was a frequent symptom, and there was an increased tendency to infection. Microscopically the kidneys showed swelling of the epithelium of Bowman's capsule and cloudy and fatty degeneration of the tubular epithelium. In addition there was hyaline degeneration of the capillaries of the glomeruli. Suzuki is of opinion that the nephritis was the result of derangement of the general metabolism of the body due to the abnormal diet, and that the similar disease in man is probably due to analogous metabolic changes. Kusano describes experiments bearing on the influence of an excess of nutrient material on the liver. Six series of experiments were carried out: (1) feeding with cane sugar (30 to 60 grams daily) for prolonged periods (30 to 135 days), and (2) for shorter periods (2 to 65 days); (3) feeding with glucose; (4) feeding with casein (15 to 50 grams); (5) with peptone; and (6) with casein and cane sugar combined. In all of these experiments atrophic cirrhosis of the liver resulted; there was a deposit of fibrous tissue at the periphery of the lobules, together with parenchymatous degeneration of the epithelium, the two changes being, in the author's opinion, independent of each other. Kawamura and Kazama, following up a previous observation that the young of rabbits infected with *Schistosoma japonicum* showed evidences of rickets, found that the disease could also be produced by injecting the parasite directly into the young animals. Both macroscopic and microscopic evidences of rickets were present, and the calcium content of the bones was reduced. Generally a complete cure resulted in about a hundred days; it was hastened by the administration of thyroid powder. Miyagawa has studied the toxic action of the cells of the alimentary mucous membrane in relation to the formation of gastric ulcer. He was able to produce iso-gastrotoxins and iso-enterotoxins, by means of which ulceration of the digestive tract could be induced; similarly with regard to auto-gastrotoxins and auto-enterotoxins. The formation of cytotoxin varies in different individuals, and the susceptibility of normal animals to the cytotoxin varies also. In addition to their direct action in producing ulcers, the author considers that the cytotoxins hinder the healing of ulcers arising from other causes. An enterotoxin or hepatotoxin will at times produce a gastric ulcer, but not with the same degree of certainty as gastrotoxin.

SCIENTIFIC AND INDUSTRIAL RESEARCH.

THE Report of the Committee of the Privy Council for Scientific and Industrial Research for 1922-23[1] shows the far-reaching importance of the work carried on under the auspices of this Committee. The civil departments concerned in public administration, it is noted, are making larger use of the machinery now existing for the scientific attack upon problems that affect them. As part of the policy of co-ordination, periodic conferences have been held between representatives of the Department of Scientific and Industrial Research, the Development Commission, and the Medical Research Council, at which the biological secretary of the Royal Society has been present. These conferences, the report states, have provided valuable opportunities for the consideration of such matters as the responsibility for the conduct of investigations at borderlines, the possibility of co-operative action in the conduct of investigations in which more than one of these departments may be interested, and the continuance of research work which has developed in such a way as to bring it outside the scope of the fund originally aiding it. These discussions have helped to define the common problems of human and animal disease, and have emphasized the interdependence of biological and physical research. They have driven home to the Committee the conviction that a national policy in research, complex though it might be and directed by diverse and suitably designed organs, must be conceived and implemented as a unity. A series of conferences were held during the year with the management of the British Empire Exhibition, and a departmental committee was appointed to consider how science and the application of science to industries could best be represented. It was agreed with the exhibition authorities that they should appoint a small committee, nominated by the Royal Society, to assume responsibility for the organization of the central scientific exhibit, and a larger committee, acting on behalf of the research associations, to deal with the general organization of sectional scientific exhibits. With regard to the plea that was made in last year's report that a vigorous search for new knowledge and the more effective application of science to industrial processes offered a potent means of re-establishing our country and maintaining its population, it is recorded with satisfaction that in December, 1922, an Act with a similar end in view was passed in France, creating a national office for scientific and industrial researches and invention in connexion with the Ministry of Public Instruction. The report includes a summary of the work of the various research boards and committees of the Department of Scientific and Industrial Research. At the National Physical Laboratory, in addition to the researches which it necessarily undertakes in the discharge of its primary functions as the custodian of national standards, with a view to the improvement of measurements of all kinds, including those relating to standards of quality, much research work of a general character is carried out. It includes researches involving continuous observations over a very extended period of time, and researches requiring the use of exceptionally expensive equipment or other special facilities—for example, work at very high voltages or at very low temperatures. The Food Investigation Board dealt with varied problems affecting fruit, meat, fish, and eggs; many of these have been noted in our columns. Among new investigations which are being carried on are the design of a commercial gas store for fruit, the growth and respiration of fungi under various conditions, the study of vegetables in transit from producer to market, the autolysis of meat and of fish, the bacteriology of fish, and the freezing point of eggs in relation to the risk of overcooling. A report from the Oxygen Committee, shortly to be published, contains descriptions of the improvement of the known method of handling liquid oxygen and liquid air on a practical commercial scale; of these methods the Committee has been principally concerned with the development of the double-walled vacuum vessel as a container. Among the other boards and committees carrying on different branches of research work are the Fuel Research Board, the Geological Survey Board, the Radio Research Board, the Physics, Chemistry, and Engineering Co-ordinating Research Boards, the Fabrics Co-ordinating Research Committee, the Adhesives Research Committee, and the Lubrication Research Committee. During the academic year 1922-23 the Committee made 403 grants to research workers and students in training; of these 252 were allowances to students to enable them to take advantage of the facilities offered by various universities and colleges or other research institutions, 33 were personal grants to research workers to undertake independent research or to act as scientific assistants

[1] H.M. Stationery Office. 1923. Price 4s. net.

to other investigators, and 14 were grants to scientific workers to enable them to employ laboratory assistants or to purchase equipment; the total expenditure on these grants was £50,000. The total expenditure of the Committee during the financial year was £497,549, of which £264,493 came directly from the Exchequer, while £89,608 represents fees for tests and special investigations for outside bodies, and repayments from the Service departments.

DETACHMENT OF THE RETINA.

The treatment of detachment of the retina is so unsatisfactory that it seems worth while to record any suggestions, and we therefore give particulars of an operation recently devised by M. Félix Lagrange and described by him in *Glaucome et Hypotonie*, published in Paris last year. The operation, to which the term "colmetage" is applied, is performed under cocaine anaesthesia. With the galvano-cautery a series of points is burnt more or less deeply into the sclerotic, round one half of the limbus; these points are arranged in three rows; it is not necessary to dissect up a flap of conjunctiva first. The burning point is laid on, for the first row, just beyond the limbus, and a half-circle of dots, usually about ten in number, is burnt; the second row is placed a little further back, and the last row further back still; in this way half the circle of the limbus is surrounded, and the other half may be completed at another sitting if necessary. We have heard of one case of retinal detachment treated here in this way; the immediate result was brilliant, for very useful vision was regained; after a year, however, the man returned with a recurrence, and this has resisted all treatment. The theory of Lagrange's operation is that the burning induces sclerosis of the tissue surrounding the filtration area of the eye, and that in consequence the tension is raised in eyes in which the tension is low and in which detachment has occurred. Of course, before undertaking this operation it would be necessary to see that the retina was untorn and that the vitreous was in a healthy state; with a torn retina and with an unduly fluid vitreous, as evidenced by a gross amount of freely movable opacities, any operation could be undertaken only with considerable hesitation.

THE LONDON SCHOOL OF DERMATOLOGY.

We announced briefly in our last issue that in order to further the study and teaching of dermatology in London a comprehensive scheme of co-operation had just been completed in connexion with St. John's Hospital for Diseases of the Skin. For many years past it has been recognized that dermatology in the metropolis has suffered from want of concentration and combined effort. Each of the London general hospitals has its dermatological department, for which as a rule one physician takes responsibility. The new scheme is the outcome of negotiations that have been proceeding during the last few months between the medical staff of St. John's Hospital and a number of leading London dermatologists, with a view to developing further the existing facilities at St. John's, and combining to establish a central school for the study of clinical dermatology and cutaneous pathology. The hospital, situated centrally in Leicester Square, presents ample clinical opportunities and possesses considerable facilities for concerted teaching. Under the new scheme additional members have been appointed to the staff of St. John's Hospital. Thus Sir Malcolm Morris and Dr. J. H. Stiles have joined the consulting staff, and will each have a seat on the board of management; Dr. Wilfrid Fox and Dr. Henry MacCormac have been appointed to the active staff; Dr. J. M. H. MacLeod becomes director of the pathological department; and the venereal diseases department will be in the charge of Dr. Wilfrid Fox. The other feature of the scheme is the establishment of a school of dermatology, having an intimate connexion with the hospital, where all the teaching will be carried out. The management of the school, though working in close touch with the medical committee of the hospital, will be in the hands of a larger body, consisting of the medical staff (both consulting and active) of St. John's Hospital, together with the physicians in charge of the dermatological departments of the twelve metropolitan hospitals with medical schools attached. Under the auspices of the school the Chesterfield lectures, constituting a systematic elementary course in dermatology, will be given on Thursdays at 5 p.m. from October to March, by the honorary medical staff of St. John's Hospital. Special lectures and demonstrations will be given on Tuesdays at 5 p.m. by the physicians in charge of the dermatological departments of the London teaching hospitals. Instruction will also be given daily in the out-patient department, and it is proposed to make arrangements for classes or individual instruction to be given in the pathological department. Further information on all these matters may be obtained from the Dean, Dr. M. G. Hannay.

THE COUNCIL DINNER.

The Council of the British Medical Association is holding its second Annual Dinner on Wednesday, October 24th, at the Hotel Victoria, Northumberland Avenue, at 7 for 7.30 p.m. The chief guest will be Sir Dawson Williams, and the dinner will be made the occasion of celebrating his completion of twenty-five years as Editor of the British Medical Journal. Among those who have accepted the invitation, issued in the name of the Chairman and members of Council, are the Minister of Health, the President of the Royal College of Surgeons of England, the President of the Royal Society of Medicine, Sir George Newman, Sir Arthur Robinson, the heads of the Medical Departments of the Services, and the newly appointed Medical Adviser to the India Office (Major-General J. B. Smith). The dinner last year was very successful, and there was not enough room for all who wished to attend; a larger hall has been secured for this occasion. Members may bring guests, and ladies will be welcomed. Applications for the remaining tickets should be made at once to Mr. L. Ferris-Scott, Financial Secretary and Business Manager, 429, Strand, W.C.2. The price is 10s. 6d., exclusive of wine.

THE MEASUREMENT OF PROGRESS IN PUBLIC HEALTH.

Sir Arthur Newsholme delivered the William Farr lecture at the London School of Economics and Political Science on October 4th. His subject was "The measurement of progress in public health." The first part of the lecture was devoted to an examination of the work of William Farr, who was appointed compiler of statistics in the General Register Office in 1837, and for forty years subsequently devised the methods and supervised the actual compilation of national mortality statistics. Farr's guiding principles were that the evil factors at work in the community, making for injury to life and health, must first be measured, that their relative incidence in respect of age, sex, social condition, and so forth should next be ascertained, and that finally public attention should be drawn by every possible means to the facts thus ascertained. Most vital statistics consisted of aggregates in which it could not be ensured that one causal factor was isolated from others which were in action at the same time. Thus infant mortality was directly related to poverty, but extreme poverty or prosperity might both be

associated with a high or low infant mortality, and in any social situation the complex poverty and the complex infant mortality both needed to be investigated before it was decided what were the factors at work in a particular instance. The chief difficulty in mass statistics was to segregate from a number of coincident factors the factor which was under investigation. It was because Farr saw the difficulty so clearly and endeavoured to provide for it in the public work he did that his name was held in such high honour by statisticians and among those interested in public health. Sir Arthur Newsholme paid a tribute to Farr's mathematical genius, and mentioned that he was one of the two members of the medical profession admitted to the honorary fellowship of the Institute of Actuaries. His work had been extended by his successors, notably by Dr. T. H. C. Stevenson, and the appreciation of the value of vital statistics as an instrument of research, a guide to sanitary effort, and a means of public enlightenment, was becoming widespread. The function of statistics was to sum up many individual experiences in a single statement. Among the causes of error the personal equation of the observer himself in the selection and use of data was of importance, and it might be necessary to remain satisfied with a qualitative interim judgement, although this in some cases was as likely to be erroneous as an attempted quantitative judgement. Inadequate evidence could never be made more complete by continuing to scrutinize it. As an illustration of the pitfalls of statistics he quoted the official report issued in 1920 giving the results of the physical examination for military service of 2,500,000 men in the eleven months ending October, 1918. Of these men over 10 per cent. were found permanently unfit for military service. Unduly pessimistic inferences had been drawn from these figures. He agreed that what the figures disclosed was a serious state of affairs, but before accepting implicitly the percentages for each of the four grades into which the men were divided it was necessary to have some assurance that the physiological standards applied were appropriate and uniform. Could mass statistics be trusted which were gathered at examinations by a large number of different medical boards all over the country working in very different circumstances of leisure and adequacy? The men who were examined were those left over after the fittest men of the nation had already enlisted. Another illustration of possibly erroneous deduction from statistics concerned the figures relating to crime in certain family stocks; from these figures the inheritance of criminal instincts was sometimes deduced, but was there not such a thing as moral contagion? Again, it was generally stated that one-third of all prostitutes were feeble-minded, with the apparent implication that to that extent the prevention of prostitution consisted in the control of the feeble-minded. But before this became a practical policy it must be ascertained by examination of successive random samples from the social groups from which prostitutes were derived whether the percentage of mental defect among prostitutes was in reality greater than in these random samples; he believed that this would be found not to be the case. While pointing out these and other limitations in the applicability of certain classes of statistics, he welcomed the increasing use of statistics in public health work, and the help which statistical experts could give to the solution of the many public health problems still outstanding. Lord Eustace Percy, Parliamentary Under Secretary to the Ministry of Health, who presided, said that the audience would carry away from the lecture certain necessary cautions with regard to the use of vital statistics. He mentioned the tests for mental deficiency applied to men offering themselves for enlistment in the United States Army during the war, the results of which had been quoted to suggest a ludicrously high proportion of mental defect in the American population. He did not think that the results could be taken as a general indication of intellectual capacity, or that they need arouse apprehension in any quarter. At the same time, statistics brought out significant facts; one to which public attention should be directed at the present moment was that while the infant mortality rate was falling the puerperal death rate was not falling.

MUSEUM DEMONSTRATIONS.

The course of museum demonstrations open to advanced students and medical practitioners at the Royal College of Surgeons of England (Lincoln's Inn Fields) began on Friday, October 12th, when Sir Arthur Keith, F.R.S., the conservator, gave the first of three demonstrations on hernial formations. In this he dealt with acquired hernial formations at various points of the alimentary canal. In the second demonstration, to be given on Friday, October 19th, he will deal with hernial formations of developmental origin which occur along the alimentary and respiratory tracts; and in the third, on Friday, October 26th, he will discuss the distinction between congenital and acquired forms of true hernia. Three demonstrations will also be given by Professor Shattock, F.R.S., pathological curator, on Mondays, beginning on October 15th, when he will deal with necrosis. The second demonstration on October 22nd will be on arteries, and the third on actinomycosis and Madura disease. All demonstrations will begin at 5 p.m.

THE INSURANCE SERVICE AND THE MINISTRY OF HEALTH.

In last week's Supplement we published the reply of the Minister of Health to the statement by the Insurance Acts Committee regarding the remuneration of insurance practitioners from 1924 onwards. This week we publish the rejoinder by the Insurance Acts Committee, which, it is hoped, will be read not only by insurance practitioners but by the profession generally. The present issue of the Supplement contains also the reply of the Minister of Health regarding the proposed changes in the Regulations, and in order that the circumstances may be fully understood we follow it with a summary of the position as to the proposed alterations. Lastly, we publish the final reply of the Insurance Acts Committee on this matter to the Minister, in which attention is drawn to various points upon which agreement has not so far been reached.

The gold medal of the Royal Society of Medicine will be presented to Dr. F. Gowland Hopkins, F.R.S., Sir William Dunn Professor of Biochemistry in the University of Cambridge, at a social evening of the Society, to be held on October 30th at 8.30 p.m. At 9 p.m. Professor Hopkins will deliver an address on stimulants of growth.

The munificent gift made by the Rockefeller Foundation to University College, London, and its Medical School will not have been forgotten. It has been, however, long understood that the Foundation did not intend to limit to London the financial assistance it would give to medical educational institutions in Great Britain. We understand that the Foundation has for some time been making inquiries in Edinburgh, and is about to provide the cost of a clinical research laboratory there; it is also considering the endowment of a chair in clinical surgery.

Sir John Bland-Sutton, President of the Royal College of Surgeons of England, will take the chair at the first Victor Horsley Memorial Lecture to be delivered in the Barnes Hall of the Royal Society of Medicine by Professor Sir Edward Sharpey Schafer, F.R.S., on Thursday, October 25th, at 5 p.m. Admission to the lecture is free.

INSANITY AND MENTAL DEFICIENCY.

THE annual report of the Board of Control for 1922, to which a brief reference was made in our issue of September 29th (p. 573), again brings to our notice the problems connected with the insane and mental defectives. The facts revealed in the report as to the incidence of these disorders are serious and cannot lightly be ignored by the community.

Increase of Insane Persons under Treatment.

At the end of 1922 there were no fewer than 106,247 certified patients in England and Wales, and the total expenditure on the upkeep of the county and borough asylums, and on the maintenance, supervision, and treatment of patients in them, amounted to £7,658,823. These figures do not include the numbers or cost of the certified mental defectives or of the insane and defectives in Poor Law institutions. The direct admissions during last year were 23,125, the largest number the Board has ever recorded with the solitary exception of 1914; the average annual increase in the numbers resident in county and borough mental hospitals in the three years 1920-22 was 3,482 as compared with an average pre-war yearly increase of 2,095 for the ten years ended December 31st, 1913. The increase in the numbers of admissions is somewhat disquieting, as it suggests a tendency for insanity to increase out of proportion to an increase of the population. The admission rates, however, have shown marked fluctuations in the past, and it is reassuring to read in the report that, while the ratio of admissions to 10,000 of the population in England and Wales in 1914 was 6.28, in 1922 it was only 6.06. Quite apart from the vexed question whether insanity is tending to become more prevalent, we are faced with the definite fact that the number of inmates in mental hospitals is rapidly increasing. The increase is due, of course, to accumulation, as the admissions are more numerous than the discharges and deaths. The death rate has considerably diminished in mental hospitals and will no doubt continue to do so as the standard of comfort, treatment, and nursing is raised, and the Board points out that, should the large rate of increase in the numbers resident in mental hospitals continue, the accommodation available at present and in the immediate future will be sufficient only for the needs of the next three or four years.

The Outlook.

It is thus evident that, unless we are able to diminish the incidence of insanity or effect more recoveries, the segregation of an increasing number of certified cases will be inevitable. We believe a pessimistic attitude in regard to this problem to be quite unjustifiable. Psychiatry is full of surprises. A resistive, degraded, hostile, and deluded patient, insane for ten years, may completely recover and remain well; a paranoiac to whom a hopeless prognosis has been assigned may lose his delusions and resume his place in the world—saner than he has ever been. In such cases some unknown change has occurred in the organism which results in cure, and it is obviously the task of medicine to discover those mysterious processes of Nature which both cause and cure disease. The first essential for the prevention and cure of insanity is more knowledge of its causes, and it is therefore satisfactory to find the Board ready to encourage the development of research in mental hospitals. The report includes a record of work which has been undertaken during the year, as well as a number of proposals for the organization of future research centres and laboratories. An outline of the section in the report dealing with research was given in a recent number of this JOURNAL.

Importance of Research Work.

If the increasing burden of insanity is to be diminished, not only is research essential, but early treatment as well. There is sufficient evidence to justify the view that a certain proportion of cases of mental disorder can be prevented from drifting into chronic insanity if remedial measures are taken at an early stage of the illness. The main problem at the moment is how to get incipient cases under medical treatment, and some means must be found of inducing patients and their friends to invoke curative treatment in time. The difficulty is largely a legal one, and it is most desirable, as we have frequently urged in these columns, that those legal restrictions which at present stand in the way of early treatment of mental disorder may speedily be removed by appropriate legislation.

Out-patient Clinics.

Apart from this, the Board of Control strongly advocates the creation of out-patient clinics in connexion with general hospitals for the treatment of mental cases. They point out in their report that there is a natural reluctance on the part of most people to undergo institutional treatment anywhere, and, except perhaps for the purpose of a thorough examination, it is scarcely to be expected that persons really in the incipient stage of mental disorder will submit themselves to treatment as in-patients within an institution—be that a general or mental hospital. The Board agrees that it is probably during this incipient stage that the patient most clearly feels and realizes that something is amiss with himself; being then still in possession of sufficient insight, he can himself most effectively supplement and respond to the efforts of the physician. The importance, therefore, of providing, at this stage of the illness, treatment which is acceptable as well as effective is so manifest that the Board hopes for a large extension of this valuable service. It is encouraging to read of the out-patient centres now actively at work in various parts of the country, and we feel that the good which is thus being done by early and preventive treatment may eventually result in an appreciable diminution of the admissions to the mental hospitals.

Mental Deficiency Act.

As the Mental Deficiency Act has now been ten years in existence the Board has included in the report a general review of the work that has been accomplished under its provisions. The war, and the consequent financial restrictions coming so soon after the Act came into operation, greatly curtailed the possibility of its full development. The Board, however, considers that enough experience has been gained to make plain future possibilities and to point out the lines of further advance. Certain defects have been revealed in the Mental Deficiency Act; in particular it is not at present ensuring that unity and continuity of control which is necessary to secure adequate treatment for the mentally deficient, though the Act undoubtedly aimed at creating the machinery by which these conditions could be secured. The chief difficulty arises from the lack of co-operation between the authorities responsible for mental defectives. The Education Board is responsible for feeble-minded children from 7 to 16; the Home Office is responsible for those dealt with under the Children Act, and also through the Prison Service for adult mentally defective criminals; while the Ministry of Health, through the Poor Law, deals with very large numbers of all types and ages of the mentally defective. These central authorities have corresponding local authorities, and, although the Mental Deficiency Act created an elaborate system whereby a defective could be transferred from one authority to that of another, the Board of Control has found that, in practice, it is most difficult to secure complete co-operation between the various local authorities. They feel that it is still to a large extent true that "mentally defective persons pass from one authority or institution to another, helped or detained a little in each, but permanently cared for by none."

In spite of the difficulties the Act has not been altogether unfruitful and under its provisions it has been possible to

accomplish much useful work on behalf of the mentally defective. Thus while the accommodation existing when the Act came into operation was about 3,000 beds, at the present time there is accommodation for 19,262. The summary of mental defectives under care shows that on January 1st, 1923, they numbered 15,786; compared with the numbers on the same date a year before there is a total increase of 1,976. As the report states, the increase in the numbers would no doubt have been materially greater had not the local authorities been informed that, owing to the pressing need for economy, only "urgent" cases should be dealt with. Much useful work is being done in providing supervision for those defectives who, for economic or other reasons, cannot be sent to institutions. At the beginning of the present year there were 9,854 defectives under statutory supervision, and in this connexion the Board refers very favourably to the work being done by the Central Association of Mental Welfare in establishing occupation centres for defectives who live at home. The Board is of opinion that the regular occupation and training afforded by this form of supervision will tend to reduce the number of cases who will ultimately have to be sent to an institution.

The report includes interesting details connected with the administration of mental hospitals and various suggestions for their improvement. We have thought it well, however, to emphasize more particularly the incidence of insanity in our midst because this is a matter of vital concern to the community as a whole.

OPENING OF THE WINTER SESSION.

Westminster Hospital.

The annual dinner of the past and present students of Westminster Hospital was held at the Trocadero Restaurant on Thursday, October 4th, when 116 were present, with Mr. Walter Spencer, the senior surgeon, in the chair.

In giving the toast of "The Westminster Hospital and Medical School," Mr. Spencer reminded his audience that Westminster had the distinction of being the first hospital entirely supported by voluntary contributions, and had now entered on its third century of existence in the neighbourhood in which it was founded. The voluntary system had persisted throughout and there was, he felt sure, every prospect of a continuance if the appeal shortly to be made to meet the cost of rebuilding was successful. The new building would have 235 beds and there were to be new special departments, operating theatres, and improvements of every kind which experience had shown to be necessary. In giving the toast Mr. Spencer coupled with it the name of Dr. A. S. Woodwark, the Dean of the Medical School, to whose indefatigable efforts he paid a generous tribute.

Dr. Woodwark in his reply described the condition of the school as satisfactory in every way. Each year since the war had witnessed a steady increase in the number of students, a succession of examination pass lists which compared well with those of any other medical school in the metropolis, and a gradual return to pre-war conditions as regards social and athletic activities. Although the medical school was carrying on efficiently, if under difficulties in the present circumstances, he hoped to see the hospital reopened by March and perhaps earlier. The cost of renovation was £50,000, and on completion the equipment would satisfy the most fastidious. Sir James Purves-Stewart proposed "The Universities." They had, he said, the exceptional privilege of entertaining that evening the Regius Professors of medicine of Oxford and Cambridge, the Vice-Chancellor of London University, and the Dean of the Medical Faculty of the University of Cardiff, so that the oldest universities and the youngest were represented. All were closely in touch with Westminster through members of the staff and students. With personal reminiscences, Sir James Purves-Stewart identified each of those representatives with the toast.

In his reply, Sir Archibald Garrod gave a brief but fascinating résumé of the relation of biochemistry to clinical practice. Sir Clifford Allbutt addressed himself particularly to the present-day students and drew an optimistic picture of the possibilities open to those who preferred to devote themselves to the more academic side of their profession. Mr. H. J. Waring said that the solicitude of London University was not so much as regards the size of the medical school as the quality of the work it achieved, and congratulated Westminster upon its efficiency as indicated by examination results. Professor David Hepburn pointed out that although they had their own qualifications in Wales they liked to regard the degrees and diplomas obtained in the metropolis as a kind of post-graduate finish. A considerable number of their students had passed through Westminster with reciprocal satisfaction.

Mr. William Turner proposed "The Past and Present Students," adding that this was generally the most popular toast of the evening, but superseded on this occasion by that of the Chairman, to come later, to whose retirement he referred in sympathetic terms. He coupled with the toast the names of Dr. Robert Nimmo Watson, who had most patriotically come all the way from Harrogate, and Mr. R. A. Hickling. Dr. Watson, in a much appreciated speech, ably voiced the sentiments of the men in general practice who had known Mr. Spencer throughout the whole of their career and had found every year more reasons to express their gratitude. Mr. Hickling, in representing the present students, said that the only thing to complete their satisfaction would be the provision of an athletic ground of their own.

Mr. Arthur Evans, in proposing "The Visitors," said that besides the distinguished guests from the universities they were happy to welcome, among others, the Head Master of Westminster School, Mr. H. Costley-White; the High Master of St. Paul's School, Dr. Hillard; the Head Master of Epsom College, Mr. Arnold Powell; the Chairman of the Hospital, Sir Edward Pearson; the Secretary, Mr. C. Power; the Architect, Mr. Percy Adams; and Dr. Eric Marshall, who would be remembered as one of Sir Ernest Shackleton's party. He coupled with the toast the name of the Rev. Harold Costley-White. Mr. Costley-White expressed his very great pleasure at being entertained by the hospital, with which he was so closely associated and for whose kind services he had abundant reasons to be grateful. As a schoolmaster, he regarded a medical education as a very liberal one, and a medical career as an ideal for which he had always felt that a boy required a very early preparation psychically as well as academically.

Dr. de Havilland Hall, with many affectionate references, proposed "The Chairman," his old colleague now retiring from the staff of the hospital, which he had served so loyally for thirty-five years. Mr. Spencer briefly replied.

Charing Cross Hospital.

The annual dinner of past and present students of Charing Cross Hospital was held on Wednesday, October 3rd, at Gatti's Restaurant, with Dr. T. Watts Eden in the chair. The toast of "The Hospital and Medical School" was proposed by Mr. Peter Daniel, who commented upon the fact that the medical school, having welcomed women students during the war, had no intention of shutting its doors upon them; the women students had added to the strength of the school. Dr. W. J. Fenton, Dean of the Medical School, who replied to the toast, said that the position gained by the school in recent years had been well maintained; the number of students at present was 170, and 33 had qualified during the past twelve months. The health of "The Guests" was proposed in felicitous terms by Sir Herbert Waterhouse, and replies were made by the Right Hon. Sir Donald Maclean, M.P., Sir Humphry Rolleston, President of the Royal College of Physicians, who told a Scots story, and Professor Walter W. Chipman, professor of obstetrics in McGill University, Montreal. Professor Chipman said that Canada was proud to act as a liaison between the old country and America. He contrasted the hospital dinner with the "Year Dinners" in Canada, which were run entirely by the

students. The health of "The Chairman" was proposed by Dr. Cuthbert Lockyer, and Dr. T. Watts Eden briefly responded. During the evening an excellent musical programme was carried out by Dr. Beaton, Dr. P. V. Davies, Mr. Green, and by Mr. Malcolm Scott and other artists from the Coliseum.

School of Pharmacy.

At the opening of the eighty-second session of the School of Pharmacy of the Pharmaceutical Society of Great Britain, on October 3rd, the inaugural address was delivered by Dr. W. E. Dixon, F.R.S., Reader in Pharmacology in the University of Cambridge, who spoke on "Drug treatment: past, present, and future."

Dr. Dixon said that he desired to give the students some reasons for believing that treatment by drugs was as yet in its infancy, and to offer them, therefore, encouragement in their profession, which he believed had a great future and unlimited possibilities. The whole outlook on treatment had been altered by reason of the gradually accumulated knowledge that the animal body elaborated its own drugs, stored them generally at the seat of formation, and doled them out to the tissues to meet the needs of the animal economy. The normal functions of the body were regulated, at least partly, by these natural drugs—of which adrenaline and pituitrin were examples—and it might be that all functionings were of this nature, and that the object of a nerve supply was to localize the liberation of the drug in some definite situation. Obviously, then, animal products had assumed once again a great importance in pharmacy and pharmaceutical chemistry—such an importance, indeed, that some knowledge of the animal anatomy and physiology was almost an essential to the educated pharmacist of to-day, and he had little doubt that before long it would form a not unimportant part of the pharmacist's curriculum.

Passing to consider how far drug treatment had advanced in the cure of disease due to the introduction into the body of some extraneous factor, Dr. Dixon pointed out that in several instances, especially in diseases due to protozoa, it was possible to destroy the causal agent of the disease by drugs; the disease was cured, but, curiously enough, the action was not necessarily brought about by the direct effect of the drug on the causal agent. The organic compounds of arsenic had no decided effect on the spirochaetes of syphilis in the test tube, but they destroyed them in the body; emetine, an alkaloid from ipecacuanha, did not kill the amoeba of tropical dysentery except in the human body. Chemists and pharmacologists had as yet made little progress in their attack on bacterial diseases such as tuberculosis, but the fact that one of the quinine derivatives, ethylhydrocuprein, administered to man in appropriate doses, destroyed the micro-organisms causing pneumonia suggested a happy augury even in this field.

After stating some physico-chemical problems as to drug action which still awaited solution, the lecturer said that drugs might act not by any particular action on the living matter, but because they collected in such quantities in living cells as to clog the working of the machine. The vast group of hypnotic drugs, differing widely in their chemistry, had one common factor, the power of diffusion into living cells, comparative insolubility in water, and a greater solubility in fat and fat-like compounds. It was not a general rule, however, that drugs which exerted a selective action on some tissue tended to collect in that tissue; strychnine did not collect in the spinal cord, nor morphine in the brain. Adsorption, or the concentration of soluble substances on surfaces, accounted for the action of some drugs. Osmosis, again, was the principal factor concerned in the action of the saline purgatives and diuretics. Dr. Dixon concluded with some advice to those students who were to become retail chemists; he spoke of their need for an understanding of life and of men, as well as for an accurate knowledge of the art of dispensing.

The Dean (Professor H. G. Greenish) reported that negotiations with the University of London with a view to establishing a science degree in pharmacy were making good progress, and he hoped that before the next session of the school they would have reached a satisfactory conclusion.

PUBLIC HEALTH IN SOVIET RUSSIA.

BY

L. HADEN GUEST, *M.C.*, M.R.C.S.

I. The Epidemic Situation.

In the years 1918, 1919, and 1920 the statistics of disease and of epidemic conditions in Russia gave figures which aroused incredulity and were almost incapable of realization in terms referable to ordinary Western European experience. Typhus and relapsing fever were dealt with in millions and other diseases, such as typhoid fever, small-pox, diphtheria, malaria, and scurvy, in thousands. By June of the present year (1923) the monthly figure for typhus cases had sunk down to thousands and small-pox and relapsing fever to hundreds. One may say, indeed, that the epidemic situation is well in hand.

The figures in the tables below are taken from the *Statistical Bulletin* of the People's Commissariat of Health for July, 1923, and have been checked by the Epidemic Commission of the League of Nations. While not comparable as regards accuracy with the figures of the notification of disease in Great Britain, they are substantially correct.

The large figures of the railway and river service probably give the key to the efficiency of the work. For a real effective and sanitary control of railway and river transport has been established, and a separate medical sanitary and hospital service created for the purpose.

	Typhus.			Relapsing Fever.		
	Russia in Europe.	Siberia, Caucasus and Central Asia.	Railway and River Service.	Russia in Europe.	Siberia, Caucasus and Central Asia.	Railway and River Service.
January ...	43,396	6,279	52,162	47,855	9,131	60,347
February ...	32,709	6,144	40,323	32,049	6,093	39,827
March	30,746	3,518	38,021	23,315	4,509	29,109
April	21,953	3,027	25,991	16,782	3,145	20,808
May	13,967	1,980	15,552	9,388	2,207	12,168
June 3-9 ...	1,468	334	1,871	811	352	1,243
,, 9-16 ...	1,303	203	1,563	836	219	1,147
,, 16-23 ...	801	116	961	419	121	585
Total ...	146,343	21,601	176,247	131,455	25,777	165,234

	Small-pox.			Malaria.		
	Russia in Europe.	Siberia, Caucasus and Central Asia.	Railway and River Service.	Russia in Europe.	Siberia, Caucasus and Central Asia.	Railway and River Service.
January ...	4,169	1,971	6,447	64,346	18,349	94,377
February ...	4,360	1,572	6,248	76,639	17,564	101,098
March ...	4,319	1,631	6,154	158,953	29,392	159,808
April	4,118	1,323	5,582	288,891	36,849	292,647
May	3,256	806	4,208	293,876	37,915	384,016
June	—	—	—	211,495	30,374	268,087
June 3-9 ...	439	141	605			
,, 9-16 ...	429	116	574			
,, 16-23 ...	326	66	405			
Total ...	21,416	7,626	30,123	1,039,200	170,443	1,340,033

The sanitary control of the railway and river communications is carried out as follows: In each large railway station there is a real effective sanitary control, a medical officer is present at the arrival of each train from the south (the area of epidemics), and a medical inspection of passengers is carried out. This is not an individual examination but an individual questioning. Previous to the arrival of the

train the "contrôleur" of each railway coach questions personally each passenger and any cases of suspected illness are noted; passengers are also questioned as to any illness they have noticed among others. There is also a medical inspection at each big railway junction. Attached to stations where inspection takes place are hospitals and disinfection plants for dealing with cases of actual illness and with suspects.

I can testify from my own observation that railway stations and railway carriages are kept clean and tidy. I travelled from Moscow to Minsk, a twenty-seven hours' journey, on an ordinary slow train and had many opportunities of getting out at wayside stations, to get meals or buy papers or just walk about, and all were in excellent order. The food was good and cheap, though served in a somewhat rough and ready way; most stations had on sale different kinds of white bread, chicken, sausages, meat of various kinds, eggs, milk, lemonade, bottled beer, chocolate, etc. Little children sold fruit, chiefly apples. Drinking water is provided at most stations, and at many hot water is provided for making tea.

The first-class carriages were fitted as four-berth sleeping compartments; I had a compartment to myself most of the way, and the conductor made me tea whenever I wanted it. No bedding was provided (bedding is provided, however, on the express trains and the wagons-lits), but the carriages were quite as clean as those on the Polish side of the frontier and were certainly better lighted at night. From Minsk to the Polish border (a three hours' journey) I travelled in a third-class coach with wooden seats and no upholstery of any kind. The paint was ancient but the coaches were clean.

A factor in the improvement of the sanitary condition of the country is undoubtedly the general return towards normal which is a marked feature of Russia at the present time. For with this there goes an improvement in the moral of the population and so of their cleanliness. The peasants also, despite high taxation, are on the whole better off than they were, and considerable numbers of new houses are being built in the villages. But the largest share is probably to be put down to the sanitary campaign of the Commissariat of Health, which, under the leadership of Dr. Semasko, has carried its propaganda and its organization from one end of Russia to the other. This organization is particularly noticeable on the Volga, where each vessel coming from the south has to moor at a sanitary quay (which is provided everywhere) and each passenger is questioned closely about himself and about others. It is an effective system of mass inspection which supplements notification of illness by the officials of the vessel concerned.

The control of persons leaving Russia is also very strict; only certain frontier points are allowed to be used legally, and evasion is difficult and hazardous. At each point it is necessary to present a certificate that the person has been examined for (*a*) typhus fever, (*b*) relapsing fever, and (*c*) cholera.

Large epidemics other than those already mentioned do not exist—the number of cholera cases has been less than 100 for the whole of Russia during this year, and although there was (August, 1923) a small epidemic of plague, about 100 cases, near Tsaritsin, which is close to the endemic centre in the Steppes, it is at present strictly localized.

Among other important factors which have helped in the control of the epidemics it is necessary to mention first the Epidemic Commission of the League of Nations, acting through Dr. Haig and Dr. Panteleoni, which has played an important part. The executive and organizing ability of these two officers and the existence of an office at Moscow have undoubtedly been of the greatest service to Russia.

Another helpful factor was the work of the American Relief Association, which in addition to aiding the relief of the famine on a very large scale, helped also in the equipment of hospitals all over the country, so that numbers of institutions are still carrying on their work with materials supplied by the American Relief Association. Indeed, practically every relief unit of every nation did some more or less medical work and contributed some medical supplies.

The return to the normal, previously referred to, has been largely helped by the opening up of free trade within the country. But the political fact must not be forgotten that the possibility of organization within the country or of help from without has only been possible on any extensive scale since the cessation of military intervention against the Bolsheviks and the opening up of diplomatic and trade relations with foreign countries, which dates (effectively) only from the beginning of 1921. The medical work accomplished up to the present, therefore, has been largely done during the last two and a half years, a fact which makes its success the more remarkable considering the heritage of disorganization and even of military destruction—as of railway lines and bridges for instance—with which the sanitary administration has had to grapple. In this work not only have the doctors worked heroically, very many unfortunately having died at their posts, but the Communist party, the rulers of Russia, have supplied personnel to do some of the more terrible and dangerous sanitary services, such as cleaning out towns encumbered with corpses and filth. Very few doctors in Russia are Communists; but, politics apart, it must be recognized that in the ranks of that party there have been found men and women with the cold 2 a.m. kind of courage that has enabled them to face the danger of almost certain death from infectious disease, when carrying out the more horrible and dangerous tasks in a great sanitary campaign, and not when acting as principals but as subordinates.

Now that the louse-borne epidemics have been controlled the mosquito-borne epidemic is to be tackled. At present almost all equipment is lacking and the supply of quinine is quite inadequate; it is estimated that 20,000 kilograms of quinine hydrochloride are required at once.

The groundwork for the antimalarial campaign is, however, already laid, as, apart from the general medical service which works efficiently and devoutedly, there are 250 doctors who have attended special antimalarial courses organized by the Epidemic Commission of the League of Nations, and in October of this year another 100 will have completed their course. Part of this course is given by Russian doctors, professors of universities, and specialists, and part by medical men from other countries. Representative men from France, Italy, Czecho-Slovakia, and Germany have already taken part in this work, but up to date no one from England.

The amount of typhus and relapsing fever recorded in June is probably that normal for the country, and not to be completely removed until the social conditions of certain endemic centres in Moscow, Petrograd, and other large towns can be changed. The effort to make these changes is now being made and will probably be successful in a few years' time. Meanwhile the problem of malaria remains one of urgent importance, and the statistics here show an unfortunate increase in illness on a large scale. The mortality is also very high, in the absence of quinine or other methods of treatment, and it is even stated to amount to 40 per cent. of cases attacked in some places. The severe forms of malaria occur in the Caucasus and the South, but there is much malaria in other towns. Fortunately, that in Moscow is of a mild type.

Beyond the question of malaria there looms up the question of syphilis and of tuberculosis. Tuberculosis is said to be more than twice as prevalent now as before the war; but syphilis in some districts affects 80 per cent. of the total population, and its treatment must be a matter of years.

A harvest of disease still to be reaped will accrue from the after-effects of the famine in the southern parts of Siberia. The actual famine is now over and relief measures are no longer required. But there are still places where food conditions are not good, and there are all the results of deprivation still remaining among the survivors of the famine which will only become fully apparent in the course of some years. Of the general effects of conditions in Russia on the health of the population it is too early to speak, but it is already clear that, while many peasant villages have not been largely affected, the residents in the towns have been subjected to a very great strain, under

which very many have broken down. Thus a recent writer in a Communist paper stated that 75 per cent. of the Communist party were ill as a result of strain, overwork, and war conditions, and the general level of health of all townspeople has certainly greatly deteriorated. It is only this year, for the first time, that Communist leaders, Government officials, and important workers in all grades have been able to take a holiday. The trains to the health resorts of the Caucasus and the Crimea (a Russian riviera and very beautiful) have been packed, and tickets were only obtainable with difficulty. But the taking of holidays is at least a sign of the strain relaxed and this will probably be reflected in a general health improvement at a later date.

Scotland.

Glasgow Southern Medical Society.

This Society met in the rooms of the Glasgow Medical Club on October 4th, when Dr. J. Grant Andrew delivered his honorary presidential address on "Molière and the doctors." He gave a sketch of Molière's life, and surveyed the state of medical practice during *le grand siècle*. The battle of the three great corporations in Paris in the seventeenth century were recounted and the narrow boundaries of the humoral view of medicine were traversed. Dr. Andrew noted that three of the great discoveries of the century—the circulation of the blood, and the therapeutic use of quinine and antimony—were scouted by the faculty for the pettiest of reasons. The profession of those days made an admirable butt for the shafts of a great satirist, himself a sufferer at the hands of pedants and charlatans, and the change from the light raillery of the earlier plays to the ferocity of the later attacks was well brought out by the speaker. Before the address, the President (Dr. D. George Carmichael) presented Dr. Grant Andrew with the diploma of the society, and referred appreciatively to his public and professional work in Glasgow before leaving that city to make his home in Bournemouth.

Post-Graduate Study in Glasgow.

The success of the graduate courses held last winter in Glasgow has induced the board of the Glasgow Post-Graduate Medical Association to make arrangements for graduate teaching in Glasgow on similar lines during the coming winter, from November to May. The teaching will be available in three forms: (*a*) weekly demonstrations, (*b*) special courses, and (*c*) clinical assistantships. The series of demonstrations will be given on Wednesday afternoons, and has been arranged much as in former years. The range of subjects is wide, including medicine, surgery, obstetrics, diseases of children, ophthalmology, and other special subjects. This series is intended to appeal particularly to those practitioners who wish to keep in touch with recent advances in a general way, and to compare the methods of diagnosis and treatment employed in different institutions. The fee for this course, to which attending practitioners may send their own cases to be demonstrated and discussed, is three guineas. In order to provide opportunities for more intensive and systematized post-graduate study a number of special courses have been arranged, dealing for the most part with two or more allied subjects. The number of graduates attending each course will be limited, and the aim has been to provide for the serious clinical study of certain special subjects rather than a series of unconnected demonstrations on a variety of subjects. The special courses include one to be carried on at the Royal Infirmary, the Royal Hospital for Sick Children, and the Royal Maternity and Women's Hospital, providing opportunities for the study of a number of closely associated subjects connected with the welfare of the mother and the newborn infant. A course on genito-urinary surgery will be conducted in the Western Infirmary. A course of eight meetings upon medical ophthalmology will be conducted by members of the staff of the Eye Infirmary, the Ophthalmic Institution, and the general infirmaries; these meetings will be general in character and their aim will be to demonstrate the importance of ocular conditions in the diagnosis and prognosis of general disease, as well as the part played by constitutional disease in the causation of those conditions. A special course on fractures will be held at the Western Infirmary, and will comprise the surgical and pathological anatomy of fractures in general, with special reference to actual cases and demonstrations and treatment of such cases as may be in the wards. A series of clinical demonstrations on surgical diseases of children will be given at the Royal Hospital for Sick Children. The fee for each of the special courses (except the last, for which no fee is specified) is two guineas. In a certain number of the institutions taking part in the work of the Post-Graduate Medical Association a limited number of clinical assistantships are available to graduates who desire opportunities for the detailed study of a special subject. A clinical assistant must enrol for a period of three months, and must be prepared to devote to the work either the whole or part of a day, according to the terms of the particular clinical assistantship which he holds. The syllabus of the courses, containing full particulars, may be obtained from the secretary of the Association, Dr. James Carslaw, 6, Woodside Crescent, Glasgow, W.

Ireland.

Belfast Municipal Sanatorium.

Dr. Stewart, medical superintendent of the Belfast Municipal Sanatorium, states in his report for 1922 that 375 tuberculous patients were admitted during the year, a number considerably less than in the previous year: this fall was due to the diminished accommodation owing to extensive painting and repairs which had to be undertaken. There was an increase in the proportion of young adult males. The deaths numbered 85 (55 males, 26 females, and 4 children); 70.5 per cent. of these 85 had a negative family history. In 61 patients the disease was reduced to a clinically quiet state; 121 were much improved, of whom a fair number were judged capable of carrying on certain light duties. The benefit in the other cases consisted in an alleviation of suffering and the prevention of infection.

Typhus Fever in Mayo.

At a recent meeting of the co. Mayo Board of Health, the Minister of Local Government forwarded, in connexion with the occurrence of cases of typhus fever in the Belmullett district, the report of Dr. O'Dwyer, Medical Inspector, which was as follows:

I have been in Belmullett for some time endeavouring to get the Belmullett fever hospital into a habitable condition. I must prelude my remarks by pointing out that the fever hospital is quite unsuitable for its purpose, because: (1) It has no separate water supply. (2) Sanitation consists of outside dry closets only, and no arrangement for regular cleansing. (3) The building is in need of much repair (estimated cost £287). (4) It is within 100 feet of the old workhouse, now a military barracks, and has a common approach within the latter. (5) There is no accommodation for other than fever patients, and Belmullett is forty-two miles from the nearest hospital.

In these circumstances, I would strongly urge on the Board of Health the necessity for providing other accommodation, and, if necessary, building a hospital to meet the requirements of the area. On my arrival on August 20th I found that the nurse obtained by Dr. McHale had gone away. I wired to Ballina for another nurse and I could get none. I then wired to Miss Swan, district nurse in Achill, and she immediately came, and it is thanks to her energy that the hospital was put into some order. At my request she is stopping on pending the Board of Health meeting.

Ambulance.—Three horse ambulances in Belmullett are either out of repair or broken up, and the local contractor would not undertake to repair them. I consequently had to get the spare fever van in Ballina and also utilized it to bring in beds from Ballina. I would make the following suggestion to the Board of Health:

Staff.—It is absolutely necessary to have a staff at the hospital always. When an outbreak takes place if you have not the staff there and the place ready, it is too late by the time these matters have been arranged. In addition, if the stock is left in an unoccupied building it is either stolen or so seriously deteriorates from damp that a new stock is required at each outbreak. I would suggest to the Board of Health that they should keep a wardsmaid and a nurse constantly in the hospital. They should

apply to the District Nurses' Association to supply one of their nurses, who would, in case of an outbreak, nurse in the hospital and would nurse the sick in the district at other times. This would provide the very necessary service of district nursing in Belmullett, and at the same time an hospital staff for emergencies. The Board of Health would pay the nurse's salary, board, etc., which would cost £150 10s. to £163 a year.

Whether the hospital is to be in its present position long or short, the roof must be patched and the gutters repaired, and also fire grates put in all the rooms. The Board of Health will also require to get tenders for driving the ambulance, and provide some sort of shelter for it.

The board decided to adjourn further consideration of the report and, in the meantime (1) to ask the military to evacuate the workhouse, and (2) to appoint a ward maid at £40 a year and rations.

Correspondence.

THE PROBLEM OF SUCCESS FOR MEDICAL WOMEN.

SIR,—Will you allow me very briefly to refer to one paragraph in the interesting address delivered by Sir Humphry Rolleston at the London (Royal Free Hospital) School of Medicine for Women on October 2nd? I do so at his request.

In considering the problem of success for medical women, he stated that "in 50 per cent. or more of women the monthly rhythm is a distinct handicap." Now happily the more rational life lived by women to-day has so altered the incidence of pain and malaise during menstruation that, whatever may have been the fact in the past, recent investigation shows that a very small minority of women suffer from any such disability.

Miss Wiltshire, M.Sc., published in the *Lancet* of August, 1921 (p. 388), the results of observations on basal metabolism and oxygen consumption, showing no monthly change.

Dr. Hollingworth of Columbia University made careful observations on men and women with the object of observing any effect which menstruation might have in women on speed of movement, steadiness of hand, accuracy of perception, and association of ideas. The result was that no inefficiency in practical or mental work could be detected, during the menstrual period, as compared with other parts of the cycle, nor was fatigue more readily induced at that time.

Dr. Sanderson Clow, in a paper published by the BRITISH MEDICAL JOURNAL on October 2nd, 1920, gives useful guidance in the rational treatment of adolescents during menstruation, and shows that the percentage of girls in a large college who suffered no pain or disability of any kind was increased from 73 to 85 per cent. when baths and usual exercises were continued throughout the period. In only 2 per cent. was serious disability present.

I may refer those interested in the subject to Dr. Chisholm's article in the *Encyclopaedia of Midwifery and Diseases of Women* (Oxford Press) and to the chapter on menstruation in *Womanhood and Health* by Dr. Christine Murrell.—I am, etc.,

London, W.1, Oct. 9th. FLORENCE E. BARRETT.

BETEL CHEWING AND CANCER.

SIR,—The letter of Mr. R. L. Spittel on the relationship between betel chewing and cancer of the cheek (BRITISH MEDICAL JOURNAL, October 6th, p. 632) is both valuable and welcome. Hitherto the data necessary for establishing a causal relationship between them have been disappointingly meagre. As far as my reading goes, no estimate of the prevalence of this cancer has yet been offered, and in spite of repeated interrogation of medical friends who might have a first-hand knowledge of its occurrence I have failed to elicit good evidence. For all we know to the contrary epithelioma of the inside of the cheek might be no commoner in betel chewers than in other populations not addicted to the practice. And for that reason I ventured to advise caution in accepting a proposition which, personally, I was far from denying.

Mr. Spittel's rough estimate of its frequency dispels that hesitation. May I respectfully urge him to communicate at greater length his experience of betel-chewer's cancer? The age incidence, its frequency as disclosed by hospital or other records, its latent period, its precancerous forms, and its course are some of the important points on which he can speak with unquestionable authority.—I am, etc.,

London, S.W., Oct. 6th. ARCHIBALD LEITCH.

SIR,—Mr. R. L. Spittel's letter on "Betel chewing and cancer" (October 6th, p. 632) raises the question of the source of cancer infection. Those who, like myself, do not accept the theory of irritation as a cause of cancer will look for some source of infection of the irritated region. Is the betel not put into the mouth by a hand contaminated by soil? Is the irritated penis not infected by a hand contaminated by soil? In this country is the irritated lip not infected by a contaminated hand of the man who labours on the land? Is alimentary cancer of the stomach and intestine not a result of infection from food handled by an imperfectly washed hand, such as that of a gardener?

All domestic animals and birds are liable to cancer of the alimentary tract. Soil contaminated by them or by human beings may contain the infective organism, which finds its resting place on an irritated surface. Soil is, of course, not the only thing which may harbour the infective organism. My point is that we must not concentrate too much on the "irritation." There is something else to which the irritation is only a handmaid.—I am, etc.,

Belfast, Oct. 6th. JOHN CAMPBELL.

THE TREATMENT OF TUBERCULOSIS BY THE SPAHLINGER METHOD.

SIR,—I notice a letter from Dr. George W. Cheater in the JOURNAL of September 29th (p. 585) asking if the cases published by Dr. L. Williams in a recent issue are the only ones treated by the Spahlinger serum or vaccine. As I have just returned from Geneva, where I spent several weeks with M. Spahlinger, and had every opportunity afforded of visiting his institution at Carouge and seeing and examining many cases, may I point out that there are authentic records of over 400 cases treated, with 80 per cent. recoveries. Many of them were advanced cases, regarded as hopeless. The most remarkable fact in connexion with them is the permanency of the results. I saw and examined cases treated in 1913 and 1914 who are now quite well, following their ordinary occupations, and exhibiting no trace of disease. Prejudice seems to exist in the minds of many members of the profession from the fact that M. Spahlinger is not a medical man, and from a suspicion that these serums and vaccines are in the nature of secret remedies. There is no secrecy; any member of the profession who will go to Geneva and visit the laboratory, as several very eminent men have already done, will be courteously received, and be able to see the preparation of the serum and examine cases. M. Spahlinger—who, by the way, has never charged one halfpenny for any of his serum or vaccine, notwithstanding the fact that he has had several very tempting offers, amounting to several hundred thousand pounds, from commercial interests for the sole right of producing and distributing his remedies—hopes, as soon as he has produced a sufficient quantity of serum and vaccine to demonstrate its efficacy, to publish the whole of his methods for the benefit of suffering humanity.—I am, etc.,

Manchester, Oct. 9th. THOMAS WATTS, M.D., M.P.

COLOSTOMY AFTER TRANSPLANTATION OF URETERS.

SIR,—I agree with Sir Thomas Myles's letter (September 15th, p. 486) that incontinence of urine "causes distress to both mind and body." He advocates transplantation of the ureters, in this condition, into the rectum, and, on account of the risk of infection of the kidneys, recommends a complete colostomy to be performed, the rectum being shut off to act as a reservoir for the urine.

Even though there is a risk of infection of the kidneys after transplantation of the ureters, which I do not dispute, in my opinion it would be better to run this risk

than to be burdened with a colostomy for life and with a rectum occasionally discharging urine as well.

The operation he advocates certainly cures the incontinence of urine, but is he not recommending a greater evil than that which he set out to cure?—I am, etc.,

Morpeth, Sept. 20th. LESLIE DAGGER, M.B., M.R.C.S.

ETHER *VERSUS* CHLOROFORM.

SIR,—The recent correspondence has, somewhat surprisingly, taken no account of the mixture of these two anaesthetics which has been extensively employed in recent years; it has undoubted conveniences, and has been extolled as an eminently "safe" anaesthetic agent. As a matter of fact the "safety" of chloroform and ether mixtures has been grossly overestimated, as is shown by the statistics recorded in recent reports of the Registrar-General, which are as follows:

In 1921 the return of deaths under pure chloroform was 75, under chloroform and ether 72, and under A.C.E. mixture 12.
In 1920 the deaths under pure chloroform were 88, under chloroform and ether 85, and under A.C.E. mixture 7.

The original intention of mixing chloroform with a less toxic agent was to dilute the chloroform vapour, and so minimize its lethal properties. From the point of view that chloroform kills solely by overdosage, no doubt the reasoning was good, but unfortunately the premisses were wrong, and the cold logic of the figures quoted above will do much to remove the still prevalent idea that the inhalation of an attenuated vapour is the royal road to safety.

In using chloroform it is essential to follow precisely the degree of its own particular anaesthetic effect; this is obscured by admixture with other anaesthetic vapours, and so a death under C.E. mixture may be a particularly insidious event, and difficult to guard against; it is, I believe, far easier to take suitable precautions when using pure chloroform.

I feel sure that the lethal potentialities of chloroform mixtures are unknown to the majority of those who employ them, and I trust that these few words of warning may be of service.—I am, etc.,

London, W., Sept. 27th. A. G. LEVY.

REPEATED TAPPING IN ASCITES.

SIR,—I have under my care a man, aged 38, who, after being out of sorts for some time, one morning last February on getting out of bed vomited a bowlful of dark blood mixed with food. About eighteen years previously he had syphilis and had been treated for it. I found that he had paresis of the left external rectus, causing diplopia. I referred him to an eye specialist, who, finding the Wassermann reaction positive, gave him six injections, at intervals of a week—except on the last occasion, when the interval was two weeks—of novarsenobenzol, beginning with 0.3 gram and increasing to twice that dose. The diplopia improved, but when I saw the patient again he had ascites, oedema of the legs, some vomiting, slight jaundice, and conjunctival injection. The abdomen was tapped and over 240 oz. of straw-coloured and somewhat milky fluid was drawn off. At a consultation the opinion was expressed that he was suffering from arsenical poisoning and cirrhosis of the liver. Afterwards he was tapped at intervals of four to six days, and about 200 oz. of fluid drawn off on each occasion. The liver was firm, but not greatly enlarged, it was not tender, and there were no nodules. He was in the habit of taking one glass of whisky a day. The urine was very free from albumin and measured about 24 oz. in twenty-four hours. In July he again vomited dark blood; about the middle of September continuous drainage was instituted by means of a Jacques rubber catheter kept in as suggested by Sir John O'Conor in the BRITISH MEDICAL JOURNAL of December 4th, 1920. The treatment had to be discontinued as the catheter became blocked with yellowish débris and there was considerable pain and depression. The patient is now again being tapped every four or six days, but the amount withdrawn is decreasing, owing to formation of adhesions, probably due to ingress of air when the catheter slipped out. The question is whether it is desirable to continue the tapping. Cases have been recorded in which a tolerable state of health has eventually resulted, accompanied by great varicosity of the abdominal surface, but in this case the question arises whether there may not be a syphilitic lesion, possibly a gummata, to account for the portal obstruction, which obviously exists.—I am, etc.,

October 7th. A. E.

PAY OF THE R.A.M.C.

SIR,—The letter of "Major R.A.M.C." in your issue of September 29th (p. 587) gives a perfectly accurate account of the chief grievances of the officers of the R.A.M.C., which may be summed up as inadequate pay, frequent and expensive moves, specialist pay given with one hand and taken away with the other, slow promotion, no rise of pay after fifteen years' service until promotion, an inadequate pension, and too much foreign service.

As the result of these unsatisfactory conditions the corps is melting away rapidly. Almost every *Gazette* contains the names of majors and captains R.A.M.C. retiring voluntarily. Optimists tell us that a little new blood will do the corps no harm. But unfortunately the corps is bleeding to death and no new blood is available. How can it be saved? It would be nothing short of a disaster if the R.A.M.C. were to follow the I.M.S. into the pit of oblivion.

I do not profess to be able to find a solution for all the points of the problem. It would be easier to get blood from a stone than to wring an increase of pay or pension from the Treasury, but every effort should be made to resist the threatened reduction of pay, which, if it took place, would certainly give the corps its quietus.

The frequency of moves is due to some extent to the shortage of officers, and to such extraordinary calls as was made by Constantinople, but every effort should be made to reduce them.

The juggling over specialist pay is a very sore point, and one which could easily be rectified. The Treasury rule is that when an officer holds a permanent or semi-permanent appointment he must pay income tax on his lodging and furniture allowances. The result is that a specialist's appointment, which is nominally for three years, though it carries with it the extra pay of 2s. 6d. or 5s. a day, renders its holder liable for income tax on his allowances. Now these appointments are not *de facto* permanent appointments. They are liable to be interrupted by many different amenities. I could quote several instances where officers holding so-called permanent appointments have been moved in the middle of them. I know one officer who had in the course of four years three appointments, each supposed to last three years. Therefore, as they are not by any means permanent appointments, why call them so? Let it be an understood thing that a specialist will not be moved more often than is absolutely necessary, and leave it at that. His 2s. 6d. will then be worth at least 2s. to him instead of 5d., as it is at present.

The fact that there is no provision made for any rise of pay after fifteen years' service except on promotion is evidence of a serious oversight on the part of those responsible for the Royal Warrant. Such an injustice cannot have been committed intentionally, and the mistake should be rectified by giving a rise of payment at twenty years.

I now come to the burning question of the large proportion of foreign to home service, which may be as much as two-thirds foreign to one-third at home, and is never less than one-half. This is the matter above all others which makes for the unpopularity of the corps. The first tour of service in India may be not only tolerated but enjoyed, but to the married man the second and third tours are the events he dreads most in his service. Separation, expense, ill health, have all to be faced without any compensating advantages, now that life in India is no longer cheap, and Indian pay is little if any more than home pay.

The only remedy for this unhappy state of affairs seems to be the creation of an Indian branch of the R.A.M.C. on similar lines to that of the Royal Engineers. Let the officers of the R.A.M.C., like their R.E. brothers, be allowed after a few years' service in India to volunteer for

permanent service in that country at increased rates of pay and pension. Probably by these means sufficient officers would be obtained for Indian necessities, and the remainder of the corps, after one tour in India, would have little foreign service.

Whether these views are accepted or not, it is high time that some steps were taken to alleviate the undoubted hardships of the officers of the R.A.M.C., who at present, while enjoying few compensating advantages, have more frequent moves and more foreign service than any other branch of the army.—I am, etc.,

October 5th. FIELD OFFICER.

Obituary.

SIR FREDERICK BRADSHAW, K.C.B., M.R.C.P., Major-General A.M.S.(ret.).

MAJOR-GENERAL SIR ALEXANDER FREDERICK BRADSHAW, K.C.B., K.H.P., Army Medical Service (retired), died suddenly at Oxford on September 27th, aged 88. A month ago, on the occasion of the marriage of his daughter to Lieut.-Colonel Stewart Gordon, he was knocked down and injured by a motor car.

He was born in London on December 5th, 1834, the son of Mr. G. Bradshaw, of the Inland Revenue Department, and was educated at St. Bartholomew's Hospital, taking the L.S.A. in 1856 and the M.R.C.S. in 1857. He entered the army as assistant surgeon in 1857, attained the rank of surgeon major-general on March 10th, 1891, and retired on March 10th, 1895. For the first eight years he served in the Rifle Brigade, 2nd Battalion, with which he took part in the suppression of the Indian Mutiny, serving at the siege and capture of Lucknow, for which he received the Mutiny medal with the clasp for Lucknow. In 1863-64 he was garrison surgeon at Delhi, and in 1865 was posted to the Chestnut troop of the Royal Horse Artillery. In 1869 he was appointed surgeon to the commander-in-chief in India, Sir William Mansfield, afterwards Lord Sandhurst; and continued to hold that post under the two succeeding commanders-in-chief, Lord Napier of Magdala and Sir Frederick Haines. On the staff of the last named he served in the Afghan war of 1879, receiving the medal. From 1884 to 1886 he was principal medical officer of the Quetta division, and in that capacity served as P.M.O. in the Zhob expedition on the north-west frontier of India in 1884, when he was present at the action at Hamza village, and was mentioned in dispatches. The frontier medal was not granted for this campaign. In 1886-87 he served as P.M.O. of the Frontier Field Force in Egypt, after which, for a short time, he held the post of P.M.O. of the northern district in England. From 1887 to 1892 he was again in India as P.M.O. of the Rawal Pindi division, and with that division served as P.M.O. in the Hazara campaign of 1891, when he was mentioned in dispatches in the *London Gazette* of October 20th, 1891, and received the frontier medal with a clasp, and the C.B. From his promotion to surgeon-general till his retirement he held the appointment of P.M.O. of H.M.'s forces in India, the second post in the service, next to that of director-general. He was appointed honorary physician to the Queen in 1899, and promoted to K.C.B. in 1912. He was also a F.R.G.S., and in 1882 had taken the M.R.C.P.Lond.

After his retirement he settled in Oxford, where he did much public work, as honorary secretary of the Oxford Eye Hospital, as member of the Oxford Town Council, and as a member of the committee of the Warneford Asylum. He became a Fellow Commoner of Worcester College in 1897; the university gave him the honorary degree of M.A. in 1900, and the full degree of M.A. in 1910. During the late war he acted as honorary consulting physician to the military hospitals in Oxford. He edited a memoir of Katherine Grace Loch, R.R.C., who was chief lady superintendent of Queen Alexandra's Military Nursing Service for India. In 1864 he married Ellen, daughter of Colonel R. S. Ewart, Bengal Army, and had three sons and five daughters. His youngest son was killed in the late war. The other two sons are Lieut.-Colonel F. E. Bradshaw, D.S.O., late Rifle Brigade, and Colonel C. R. Bradshaw, Indian Army. His daughters are Lady Lenox-Cuningham, O.B.E., Mrs. Cecil Kekewich, Mrs. Hunt, wife of Professor A. S. Hunt of Oxford, and Mrs. Stewart Gordon. His remains were cremated at Golders Green on October 2nd, a funeral service being held at the same time at St. Margaret's Church, Oxford.

Universities and Colleges.

UNIVERSITY OF LONDON.

A COURSE of eight lectures on the histology of the nervous system is being given by Dr. C. da Fano (Reader in Histology in the University) at King's College (Strand, W.C.2) at 4.30 p.m. on Wednesdays. The first lecture was given on October 10th.

A course of eight lectures on newer aspects of nutrition is being given by Professor V. H. Mottram, M.A., at King's College for Women (61, Campden Hill Road, W.8) on Mondays at 5 p.m. The first lecture was given on October 8th. Admission to these courses is free, and attendance on them is recognized in connexion with the B.Sc. (Honours) Degree in Physiology.

The newly elected Jodrell Professor of Physiology, Dr. A. V. Hill, will give a public inaugural lecture on the present tendencies and future compass of physiological science on Tuesday, October 16th, at 5.30. The lecture will be held in the theatre of the new anatomy building at University College. Professor E. H. Starling will take the chair. Cards of admission will be sent on application to the secretary of the college: such an application should enclose a stamped addressed envelope. The new anatomy building will be open to inspection as from 4.30 that afternoon.

UNIVERSITY OF SHEFFIELD.

THE Diploma in Public Health has been awarded to Samuel Bryson and Patrick Kane.

UNIVERSITY OF ST. ANDREWS.

THE following candidates have passed in the examinations indicated:

FIRST M.B., CH.B.—*Organic Chemistry:* B. W. Anderson, Agnes C. Cunninghame, J. W. L. Dickson, W. J. Frain, A. Thornton, R. O. Whyte. *Inorganic Chemistry:* B. W. Anderson, R. O. Whyte. *Botany:* T. Thornton. *Physics:* J. A. Blain, Adewale Doherty, J. Feldman, Victoria M. Willoughby.

THIRD M.B., CH.B.—*Materia Medica:* A. P. R. Borrowman, Barbara T. Cubitt, D. C. Dickson, Davina M. Dingwall, H. A. Graham, Janet L. M. Inglis, C. A. Lindsay, May A. Low, Janet E. Luke, Roberta G. McRae, J. H. Malloy, Mary E. Proudfoot, Renee Ritchie, E. H. T. Rutherford, R. P. J. Rutherford, Bhavani Shanker, Jean R. Sheriffs, R. W. Small, Jean J. Smith, N. I. Smith, Karam Chand Virmani, D. D. Watson. *Pathology:* Fakherddin El. Ahmadi, Janet L. M. Inglis, Surendra Nath Lahiri, Mohan Lal, Rose M. B. Lee, S. C. McPherson, Ajudhia Nath Nanda, R. Rutherford, Bhavani Shanker, Jean J. Smith, N. I. Smith, Karam Chand Virmani.

FOURTH M.B., CH.B.—*Medicine:* A. A. Finnigan, Jessie H. Fitchet, A. Henderson, J. A. G. Keddie, G. D. Laing, B.Sc., Victoria R. L. Leslie, Ena M. Liddell, F. McLagan, J. R. Miller, Hermina M. Morrison, J. R. Murray, N. Nelson, P. C. Robertson, B.Sc., Janet O. Stephen, Gertrude J. Sturrock. *Surgery:* C. R. Baxter, T. F. Black, Ellen Douglas, J. R. Graham, G. D. Laing, Jeannie P. Laird, Victoria R. L. Leslie, F. McLagan, J. R. Murray, P. C. Robertson, Gertrude J. Sturrock. *Midwifery:* Monawar Khan Afridi, C. R. Baxter, T. F. Black, N. T. Brown, W. F. Dorward, B.Sc., L. Farrell, A. A. Finnigan, A. Henderson, Lilian A. M. Johnston, B.Sc., Lutfur Rehman Khan, G. D. Laing, Jean R. Mason, J. R. Miller, N. Nelson, P. C. Robertson, Jainti Dass Sagger.

FIRST D.P.H.—*Physics and Meteorology:* Frances Heron-Watson, J. Lamberton.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

AT the monthly meeting of the Royal Faculty of Physicians and Surgeons of Glasgow held on Monday, October 1st, the following were admitted, after examination, as Fellows:

Margaret Hogg Grant, M.B., Ch.B., B.Sc., D.P.H. (Glasgow), John Aitken Gilfillan, M.D., D.P.M. (Leicester), Alexander Reginald Lester, M.B., B.S. (Edinburgh), Colin William McRury, M.D. (Manitoba), Manuel Joseph Saldanha, M.B., B.S. (India).

A copy of the bronze medal, struck in commemoration of the octocentenary of St. Bartholomew's Hospital, has been presented to the Faculty by Dr. Alexander Macphail, Ministry of Health, London.

The Services.

NAVAL MEDICAL COMPASSIONATE FUND.

AT the quarterly meeting of the directors of the Naval Medical Compassionate Fund, held on October 9th, the Medical Director-General of the Navy, Surgeon Rear-Admiral Joseph Chambers, C.B., C.M.G., in the chair, the sum of £44 was distributed among the several applicants.

DEATHS IN THE SERVICES.

Dr. John Robert Stevenson Robertson, of Hayling Island, Hants, died suddenly in London on September 26th, aged 64. He was the second son of the late Alexander Robertson, J.P., of Berwick-on-Tweed, and was educated at Edinburgh, where he graduated as M.B. and C.M. in 1881. In 1883 he entered the army as surgeon and served in the Sudan campaign of 1885, taking part in the expedition up the Nile and across the desert for the relief of

Gordon. He was present at the battle of Abuklea, in the centre of the desert, where Colonel Burnaby was killed, in which "Fuzzy Wuzzy" "broke the British square" with disastrous results for himself, for no Arab who broke into the square got out again alive. For this campaign Robertson received the medal, with three clasps, and the Khedive's bronze star. He resigned his commission in 1888 and went into practice at Hayling Island, but retired some ten years ago. During the recent war he served again as medical officer of the Southern Command School of Musketry. His son was killed in Flanders during the war.

Medical News.

THE post-graduate demonstrations of the University of Bristol have been resumed. Dr. Carey Coombs, clinical lecturer in medicine and in charge of the cardiac research department of the University of Bristol, will deal with principles of prognosis and treatment of heart disease at Swindon on October 10th. On October 12th, at Boscombe, Mr. C. F. Walters, F.R.C.S., surgeon to the Bristol Royal Infirmary, will discuss the differential diagnosis of acute abdominal conditions.

THE winter course of health lectures arranged last year by the Sheffield Joint Hospitals' Council and attended by fully 10,000 people were so much appreciated that to meet the wishes of hospital contributors a further series will be given this year. The first lecture was given on Tuesday, October 9th, by Dr. Lazarus-Barlow, Professor of Experimental Pathology at the Middlesex Hospital, who has taken for his subject cancer research, prevention, and cure. On October 23rd the lecturer will be Professor Leonard Hill, F.R.S., of the National Institute of Medical Research, whose subject is clothing and its relation to health. On November 20th Professor M. S. Pembrey, F.R.S., lecturer on physiology, Guy's Hospital, will discuss physical exercise—its value and limitations. Dr. Harold Scurfield (late M.O.H. Sheffield) will give a lecture on child life on December 11th, and Dr. Major Greenwood, medical statistician, Ministry of Health, another on the preventable mortality of middle age on January 15th, 1924. Other lectures will be given as follows: on January 29th by Dr. H. M. Vernon (of the Industrial Fatigue Research Board) on health and ventilation; on February 19th by Dr. Ethel Bentham on common-sense rules of diet and health; and on March 4th by Mr. C. J. Bond, F.R.C.S., member of the Medical Research Council, on the effect of medical research on public health; on March 25th the course will be brought to an end by Sir Arthur Newsholme, K.C.B., M.D., who will speak on the moral aspects of public health. It will be seen, therefore, that the Sheffield Joint Hospitals' Council has been fortunate enough to obtain the service as lecturers of authorities on each of the subjects with which they deal, and we do not doubt that the lectures this winter will be as well attended as were those of the last year's course. The lectures will be given in the Victoria Hall at 7 p.m. on each day.

A SERIES of lectures, free to medical practitioners, is being given at the Hospital for Sick Children, Great Ormond Street. The first lecture was given by Dr. Poynton on Thursday last. The second will be given on Thursday next by Dr. Paterson at 4 p.m. Other lectures will be given on Thursdays, ending on December 6th. Clinical instruction is given by the members of the staff at their visits; the fee for three months' attendance is 5 guineas, for perpetual tickets 10 guineas. Clinical clerkships and dresserships are open to students at a fee of 1 guinea a month.

THE programme of the Hunterian Society of London has been issued. The new session opens on October 22nd with a dinner meeting at Simpson's Restaurant, Cheapside, when Sir Bruce Bruce-Porter will deliver his presidential address on the pitfalls of medical practice. On November 19th Mr. W. B. Maxwell will open a discussion on medicine and letters at Cutlers' Hall. On December 17th a discussion on the influence of ductless glands in infancy, middle and old age, will be opened from different aspects by Dr. W. Langdon Brown, Dr. J. H. Thursfield, Dr. Leonard Williams, and Dr. H. Crichton Miller. The Hunterian lecture will be delivered on January 14th, 1924, by Sir John Thomson-Walker on infections of the urinary tract due to the *Bacillus coli communis*. The annual dinner will be held on February 12th, and the Hunterian oration will be given on March 3rd by Sir Sydney Russell-Wells on changing standpoints in cardiac medicine.

THE annual dinner of the Society of Medical Officers of Health will be held at the Hotel Cecil on Friday, October 19th. The president (Dr. T. W. Naylor Barlow, O.B.E.) and Mrs. Barlow will receive the guests at 7.10 p.m., and dinner will be served at 7.30. Amongst those who have already accepted invitations are the Right Hon. Sir William Joynson-Hicks, M.P. (Minister of Health), Sir Arthur Robinson, K.C.B., Sir Humphry Rolleston, K.C.B., P.R.C.P., the Hon. Mr. Justice Swift, Lord Riddell, Sir George Newman, K.C.B., Sir Dawson Williams, and Sir Squire Sprigge. The dinner will be followed by a few speeches and a musical entertainment. Ladies are invited, and members are asked to give early notice to the executive secretary at 1, Upper Montague Street, Russell Square, W.C.1, of their intention to be present, with the names of their guests. A payment of 12s. 6d. for each ticket should be made with applications sent before October 16th; after that date the cost of tickets will be 15s. each.

THE annual dinner of the Royal Society of Medicine will, as already announced, be held on Tuesday, December 11th, at 7.30 for 8 p.m., at the Hotel Victoria, Northumberland Avenue, when the Prince of Wales will honour the society by his presence. As it is anticipated that an exceptionally large number of Fellows will wish to attend, it is proposed not to issue tickets for guests until November 1st, after which date, if there is room available, Fellows who have applied for tickets for guests will receive them. Tickets (price 15s., exclusive of wine) will be issued strictly in the order of applications received.

THE annual dinner of the Reunion Association of the Prince of Wales Hospital, Tottenham, N., will be held at Pagani's Restaurant, Great Portland Street, W., on Thursday, November 8th, at 7.30 for 8 o'clock. The chair will be occupied by Dr. George Chappel. The price of the dinner will be 12s. 6d. (exclusive of wine) for members and their guests. The secretaries are Dr. Jenkins Oliver, 1, Devonshire Place, W.1, and Mr. S. O. Rashbrook, 7, Wellesley Road, Chiswick, W.4.

THE winter scientific demonstrations arranged by the North of England Branch will be resumed on Thursday next at the North Riding Infirmary, Middlesbrough, when at 2.30 p.m. Dr. J. P. Higham will speak on the diagnosis and treatment of corneal ulcers. Professor W. M. Hume will follow, on the treatment of heart disease, and Dr. F. J. Henry will discuss the opposing theories of tuberculosis. There will then be an interval for tea, after which Mr. A. M. Martin will speak on the diagnosis and treatment of common knee injuries, and Dr. J. A. Longley on the *x*-ray treatment of malignant disease.

A COURSE of lectures on surgical tuberculosis will be given at the Salford Royal Hospital and the Ancoats Hospital, beginning on October 18th, at 4.30 p.m., when at the Salford Royal Hospital Mr. Garnett Wright will speak on the surgery of pulmonary tuberculosis.

A CONFERENCE is being arranged by the Federation of Medical and Allied Services to take place at 12, Stratford Place, London, W.1, on Wednesday, October 24th, at 4 p.m., to consider what practical means, if any, are possible to extend in this country the system of providing for the periodical medical examination of the larger life assurance policy holders. Representatives of the management and medical staffs of the principal life offices have been invited to attend.

THE opening meeting of the Royal Society of Tropical Medicine and Hygiene for this session will be held at 11, Chandos Street, Cavendish Square, on Thursday, October 18th, at 8.15, when the President, Surgeon Rear-Admiral Sir Percy Bassett-Smith, K.C.B., will deliver his inaugural address. The meeting will be preceded by a demonstration at 7.45 of the development of the malaria parasite in the mosquito. Refreshments at 10 p.m.

A COURSE of seven public lectures on psychology and psychotherapy will be given in the Examination Schools at Oxford by the Wilde Reader in Mental Philosophy (Dr. William Brown) on Mondays at 5.45 p.m., commencing October 15th.

THE programme of the Child-Study Society, London, for the ensuing session has now been issued. On October 18th Mr. F. S. Boas, LL.D., will lecture on "Some aspects of the Departmental Report on English"; on November 8th Miss Jessie White, D.Sc., on "Auto-education"; and on November 22nd Mr. J. J. Findlay, Ph.D., on "Rhythm, labour, and child development." The lectures are given at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., at 6 p.m. On January 8th, 1924, there will be a conference of educational associations at University College, Gower Street, at 5 p.m. The object of the society is the scientific study of the mental and physical condition of children and also of educational methods with a view to gaining greater insight into child nature and securing more sympathetic and scientific methods of training the young. The president is Sir Edward Brabrook, C.B.; the chairman, the Hon. Sir John A. Cockburn, K.C.M.G., M.D.

THE Minister of Health has nominated Dr. W. J. Howarth, medical officer of health for the City of London, to be a member of the Sanitary Inspectors' Examinations Board for a further period of three years.

AT a meeting of the Society of Superintendents of Tuberculosis Institutions to be held at 122, Harley Street, at 4 p.m. on Monday, October 15th, a discussion on thoracoplasty will be introduced by Mr. W. H. C. Romanis, F.R.C.S., and a report from the committee which has been considering the question of the training of tuberculosis nurses will be presented.

A MEDICAL Prayer Union meeting will be held, by invitation of Dr. Mary Scharlieb, at 149, Harley Street, W.1, on Thursday, October 25th. An address will be given by Mr. A. Rendle Short, F.R.C.S., on evolution in relation to Christian principles. An intimation of intention to be present will be welcomed by the honorary secretary, Dr. Tom Jays, Livingstone College, Leyton, E.10.

THE method adopted for ventilating the Council Chamber of the London County Council was described at the autumnal meeting of the Institution of Heating and Ventilating Engineers by Messrs. P. M. B. Grenville and T. Moodie. By means of trunks under the chamber an individual supply is provided for each seat. Besides the main inlets, special registers are so arranged to every seat that each member can direct the incoming air either towards himself or vertically out of his range. The plant is capable of delivering 3,000 cubic feet an hour for every occupant of the chamber. The apparatus consists of a humidifier, heating batteries, automatically controlled from the chamber itself, and fans and ice tanks for cooling. The main building is heated by means of forced circulation of hot water to over two thousand radiators, having a total heating surface of 68,349 square feet. The hot-water supply to over eight hundred lavatory basins and sinks is capable of providing 71,400 gallons of hot water in an hour.

ACUTE poliomyelitis was made a notifiable disease in all the communes of the province of Rome on September 4th.

FROM July 23rd to August 15th 103 cases of plague were notified in Egypt; 7 occurred in Port Said and 4 each in Alexandria and Suez.

DR. HERMANN DOLD has succeeded Professor Uhlenhuth as director of the Behring Institute of Experimental Therapeutics at Marburg.

OWING to financial conditions forty-five hospitals were closed in Prussia during 1922, including nine private hospitals with 1,049 beds in Berlin alone.

MESSRS. WATSON AND SONS (Parker Street, Kingsway, W.C.2) have issued a new bulletin describing the *x*-ray combination horizontal couch, vertical screening stand, and high-tension transformer which they manufacture.

A PRELIMINARY summary of the vital statistics for 1922 of Prince Edward Island, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia has been published. The average birth rate of these Canadian provinces was 28.8 per 1,000, compared with 26.3 in the previous year; British Columbia had the lowest birth rate, 18, and New Brunswick the highest, 29.2. The average infant mortality rate was 86.6, ranging from 64.6 in British Columbia to 103.7 in New Brunswick. The average death rate at all ages was 10.4 per 1,000, compared with 10.6 in 1921; of the deaths 75 per 1,000 were due to cancer and 68 to tuberculosis.

Letters, Notes, and Answers.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra Westrand, London;* telephone, 2630, Gerrard.

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

"X. Y." would be glad of any references to literature dealing with sterility following mumps oöphoritis.

VITAMINS AND CHLOROPHYLL.

"J. R." (London).—Vitamins B and C occur regularly in substances free from chlorophyll. There is no reason to suspect any relation between them and chlorophyll. Vitamin A is nearly always found associated with chlorophyll. Pure chlorophyll, however, contains no vitamin A. There is a possibility that vitamin A is a substance related in some way to chlorophyll. It may be a pigment body related to, but not identical with, chlorophyll; or it may be that the presence of chlorophyll aids its formation.

INCOME TAX.

"CAECUM" sold some war stock in June, 1922, and for the year to April, 1923, returned for assessment half a year's interest. The inspector of taxes says he is liable to be charged tax on a full year's interest—that is, on the amount of interest received *in the previous year*, that being the basis of assessment for untaxed interest.

*** The inspector's statement is correct as far as it goes. If, however, when "Caecum" sold out the war stock he did not then hold and did not acquire during 1922–23 stock of identical or similar nature, he appears to be entitled, under Sec. 34 of the Income Tax Act, 1918, to have the assessment for 1922–23 reduced to the amount of the untaxed interest for that year—under the principle laid down in Brown *v.* The National Provident Institution.

Car Transactions.

"H. T. M." bought a second-hand motor cycle in 1921 for £110 (new cost £135); he sold it in 1923 for £65, buying a new car for £256.

*** The total expenditure of (£256 – £65 =) £191 was partly an outlay of capital by which an improved vehicle was obtained, and "H. T. M." is entitled only to that part which represents the cost of replacing his cycle with one similar in make and condition to the cycle as it was when he purchased it—that is, to £110 – £65 = £45.

Book Debts.

"A, B, and C" have been assessed as partners on the basis of cash receipts; the inspector has now intimated that book debts should be included.

*** Unless there is some special reason for the request—as, for instance, if "A, B, and C" have taken over a part or the whole of another practice—we do not think that the inspector's attitude is likely to be sustained on appeal before the local commissioners if "A, B, and C" resist his request. Where the gross receipts of a practice are more or less constant the amount of the actual cash receipts must approximate closely to the correct *value* of the gross bookings. For this reason cash receipts have for many years been accepted as the basis for income tax returns, even in those cases where the bookings were falling (as during the war) and the cash receipt basis therefore worked against the taxpayer. In these circumstances, and in view of the great difficulty in estimating the value of any given amount of bookings, "A, B, and C" may reasonably resist the inspector's action and appeal to the commissioners (local or special) with reasonable prospect of success if he refuses to give way.

LETTERS, NOTES, ETC.

MR. H. JESSOP of Burnley, whose advertisements have often appeared in our pages in recent years, asks us to suggest to practitioners who dispense for their patients that this is the time to order their winter supply of dispensing bottles.

DIFFICULT LABOUR DUE TO FOETAL SPASTICITY.

DR. C. H. S. HORWITZ (Streatham, S.W.) writes: Mrs. P., a primipara, aged 32, gave birth to a full-time child on September 29th. Calculating from the first day of her last period she was about three weeks overdue. Her measurements were normal, and an *x*-ray photograph showed that there was plenty of room for the head to pass into the cavity of the pelvis. The head of the child remained above the brim until labour commenced. There was an undue amount of liquor amnii. Labour proceeded quite satisfactorily until the head reached the perineum, where it remained for several hours in spite of good pains. So I decided to apply forceps, and a small amount of chloroform was administered. The head was easily extracted, but I experienced the greatest difficulty in delivering the rest of the body, which seemed so rigid. Upon the birth of the child there was a post-partum haemorrhage of some severity and difficult to control. The child was somewhat blue, and held its body in a condition of opisthotonos. It soon cried and continued to do so almost continuously for twenty-four hours. It would not attempt to suck, but could swallow water administered with a spoon. There was evidently some meningeal irritation, with the left side of the body more affected than the right. The rigid condition of the child's body, with marked head retraction, would account for the difficulty I had experienced in delivering it. The pupils were equal and reacted to light, but there was slight ptosis of the left lid. Vertical nystagmus was present. There was marked rhythmical twitching of both arms and hands, more violent on the left side. The thumbs were strongly flexed and adducted; the elbows and wrists were flexed. The legs were spastic, but to a less extent than the arms, and the feet were flexed. The child died about forty-eight hours after birth. No *post-mortem* examination was held.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 33, 34, 35, 38, 40, and 41 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 36 and 37.